**3GPP TSG-CT WG3 Meeting #122eC3-223446**

**E-Meeting, 12th – 20th May 2022 *(revision of C3-22xxxx)***

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| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **29.520** | **CR** | **0537** | **rev** | **-** | **Current version:** | **17.6.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | Update the apiVersion placeholder |
|  |  |
| ***Source to WG:*** | China Mobile Communications Group Co.,Ltd. |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | SBIProtoc17 |  | ***Date:*** | 2022-4-30 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | The "apiVersion" placeholder need to be updated as described in C4-222295. |
|  |  |
| ***Summary of change:*** | 1. Update the "v1" into “<apiVersion>” to in the core of the specification to avoid updating all the occurrences of the API version when the latter is changed2. Adding a description before Resource URI structure. |
|  |  |
| ***Consequences if not approved:*** | The quality of the TS is not improved. |
|  |  |
| ***Clauses affected:*** | 4.2.2.2.2, 4.2.2.2.3, 4.2.2.3.2, 4.2.2.5.2, 4.2.2.5.3, 4.2.2.5.4, 4.3.2.2.2, 4.3.2.3.2, 4.4.2.2.3, 4.4.2.2.3, 4.4.2.3.2, 4.5.2.2.2, 4.5.2.2.3, 4.5.2.3.2, 5.1.3.1, 5.1.3.2.2, 5.1.3.2.2, 5.1.3.2.3.1, 5.1.3.3.2, 5.1.3.4.2, 5.1.3.4.3.1, 5.1.3.5.2, 5.2.3.1, 5.2.3.2.2, 5.2.3.3.2, 5.3.3.1, 5.3.3.2.2, 5.3.3.2.2, 5.3.3.2.3.1, 5.3.3.3.2, 5.4.3.1, 5.4.3.2.2, 5.4.3.2.3.1, 5.4.3.3.2 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | This CR introduce backward compatible correction in the Nnwdaf\_EventsSubscription and Nnwdaf\_MLModelProvision OpenAPI file. |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\* First 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 is included; and/or

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

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

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; and/or

- analytics consumer information as "consNfInfo" attribute, if the "EneNA" 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.

Editor's Note: It is FFS whether to use analytics transfer specific feature instead of the generic "EneNA" feature, to support "consNfInfo" attribute and the related specific analytics transfer procedures.

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;

 and may include:

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

- 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

- 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; and/or

6) an optional list of analytics subsets by "listOfAnaSubsets" attribute with value(s) only applicable to NF\_LOAD event;

- 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);

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

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

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

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

6) identification of RAT type where the UE camps on by "ratTypes" attribute if the feature "ServiceExperienceExt" is also supported; and/or

7) identification of frequency of UE’s serving cell by "freqs" attribute if the feature "ServiceExperienceExt" is also supported;

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;

- 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;

2) if the feature "UeMobilityExt" is supported, identification of LADN DNN in the "ladnDnns" 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;

- 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;

- 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; and/or

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

- 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 are 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; and/or

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.

- 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 and "disperType" attribute with "DVDA" value;

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) 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; and/or

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

- 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 "upfId" 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.

Upon the reception of an HTTP POST request with: "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions" as Resource URI and NnwdafEventsSubscription data structure as request body, 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.

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

##### 4.2.2.2.3 Update subscription for event notifications

Figure 4.2.2.2.3-1 shows a scenario where the NF service consumer sends a request to the NWDAF to update the subscription for event notifications (see also 3GPP TS 23.288 [17]).



Figure 4.2.2.2.3-1: NF service consumer updates subscription to notifications

The NF service consumer shall invoke the Nnwdaf\_EventsSubscription\_Subscribe service operation to update subscription to event notifications. The NF service consumer shall send an HTTP PUT request with "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions/{subscriptionId}" as Resource URI representing the "Individual NWDAF Event Subscription", as shown in figure 4.2.2.2.3-1, step 1, to update the subscription for an "Individual NWDAF Event Subscription" resource identified by the {subscriptionId}. The NnwdafEventsSubscription data structure provided in the request body shall include the same contents as described in subclause 4.2.2.2.2:

Upon the reception of an HTTP PUT request with: "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions/{subscriptionId}" as Resource URI and NnwdafEventsSubscription data structure as request body, the NWDAF shall:

- update the subscription of corresponding subscriptionId; and

- store the subscription.

NOTE: The "notificationURI" attribute within the NnwdafEventsSubscription data structure can be modified to request that subsequent notifications are sent to a new NF service consumer.

If the NWDAF successfully processed and accepted the received HTTP PUT request, the NWDAF shall update an "Individual NWDAF Event Subscription" resource, and shall respond with:

a) HTTP "200 OK" status code with the message body containing a representation of the updated subscription, as shown in figure 4.2.2.2.3-1, step 2a. If not all the requested analytics events in the subscription are modified successfully, then the NWDAF may include the "failEventReports" attribute indicating the event(s) for which the modification failed and the associated reason(s); or

b) HTTP "204 No Content" status code, as shown in figure 4.2.2.2.3-1, step 2b.

If errors occur when processing the HTTP PUT request, the NWDAF shall send an HTTP error response as specified in subclause 5.1.7

If the Individual NWDAF Event Subscription resource does not exist, the NWDAF shall respond with "404 Not Found".

If the feature "ES3XX" is supported, and the NWDAF determines the received HTTP PUT request needs to be redirected, the NWDAF shall send an HTTP redirect response as specified in subclause 6.10.9 of 3GPP TS 29.500 [6].

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

##### 4.2.2.3.2 Unsubscribe from event notifications

Figure 4.2.2.3.2-1 shows a scenario where the NF service consumer sends a request to the NWDAF to unsubscribe from event notifications (see also 3GPP TS 23.288 [17]).



Figure 4.2.2.3.2-1: NF service consumer unsubscribes from notifications

The NF service consumer shall invoke the Nnwdaf\_EventsSubscription\_UnSubscribe service operation to unsubscribe to event notifications. The NF service consumer shall send an HTTP DELETE request with: "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions/{subscriptionId}" as Resource URI, where "{subscriptionId}" is the event subscriptionId of the existing subscription that is to be deleted.

Upon the reception of an HTTP DELETE request with: "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions/{subscriptionId}" as Resource URI, if the NWDAF successfully processed and accepted the received HTTP DELETE request, the NWDAF shall:

- remove the corresponding subscription; and

- respond with HTTP "204 No Content" status code.

If errors occur when processing the HTTP DELETE request, the NWDAF shall send an HTTP error response as specified in subclause 5.1.7

If the Individual NWDAF Event Subscription resource does not exist, the NWDAF shall respond with "404 Not Found" status code.

If the feature "ES3XX" is supported, and the NWDAF determines the received HTTP DELETE request needs to be redirected, the NWDAF shall send an HTTP redirect response as specified in subclause 6.10.9 of 3GPP TS 29.500 [6].

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

##### 4.2.2.5.2 Creation of request for analytics subscription transfer

Figure 4.2.2.5.2-1 shows a scenario where the NF Service Consumer (e.g. NWDAF) sends a request to the NWDAF to request the transfer of analytics subscription(s) from the NF Service Consumer to the NF Service Producer (see also 3GPP TS 23.288 [17]).



Figure 4.2.2.5.2-1: NF service consumer requests an analytics subscription transfer

The NF service consumer shall invoke the Nnwdaf\_EventsSubscription\_Transfer service operation to request the transfer of analytics subscription(s). The NF service consumer shall send an HTTP POST request with "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/transfers" as Resource URI representing the "NWDAF Event Subscription Transfers", as shown in figure 4.2.2.5.2-1, step 1, to create a request for an "Individual NWDAF Event Subscription Transfer" according to the information in the message body. The AnalyticsSubscriptionsTransfer data structure provided in the request body shall include:

- information about the subscription(s) transfer request as "subsTransInfos" attribute, which, for each subscription that is requested to be transferred, shall include:

a) the type of the transfer request (i.e. if it is a request for transfer preparation or transfer execution) in the "transReqType" attribute;

b) information about the analytics subscription in the "nwdafEvSub" attribute, its contents being as defined for the NnwdafEventsSubscription data structure in subclause 4.2.2.2.2;

c) the NF instance identifer of the consumer of the analytics subscription in the "consumerId" attribute;

and may include:

a) analytics context identifier information about the context that is available at the NF service consumer in the "contextId" attribute;

b) NF instance identifer(s) of active data source(s) the NF service consumer is currently using for the analytics of this analytics subscription in the "sourceNfIds" attribute;

c) NF set identifer(s) of active data source(s) the NF service consumer is currently using for the analytics of this analytics subscription in the "sourceSetIds" attribute;

d) information identifying the ML model(s) that the NF service consumer is currently using for the analytics in the "modelInfo" attribute;

e) NF instance identifer(s) of the ML model provider NWDAF(s) from which the NF service consumer currently subscribes to the ML model information used for the analytics in the "modelProvIds" attribute;

Upon the reception of an HTTP POST request with: "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/transfers" as Resource URI and AnalyticsSubscriptionsTransfer data structure as request body, in the successful case the NWDAF shall:

- if the "transReqType" attribute has the value PREPARE, perform the steps required for the preparation of an analytics subscription transfer, create a new Individual NWDAF Event Subscription Transfer resource and send an HTTP "201 Created" response with the URI for the created resource in the "Location" header field, as shown in figure 4.2.2.5.2-1, step 2a;

- if the "transReqType" attribute has the value TRANSFER, perform the steps required for the execution of an analytics subscription transfer, and send an HTTP "204 No Content" response, as shown in figure 4.2.2.5.2-1, step 2b.

Editor’s Note: References to 29.552 with regard to the steps required for the preparation and the execution of an analytics subscription transfer will be added as soon as 29.552 has been updated accordingly.

If errors occur when processing the HTTP POST request, the NF service consumer shall send an HTTP error response as specified in subclause 5.1.7.

If the feature "ES3XX" is supported, and the NF service consumer determines the received HTTP POST request needs to be redirected, the NF service consumer shall send an HTTP redirect response as specified in subclause 6.10.9 of 3GPP TS 29.500 [6].

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

##### 4.2.2.5.3 Update a request for analytics subscription transfer

Figure 4.2.2.5.3-1 shows a scenario where the NF Service Consumer (e.g. NWDAF) sends a request to the NWDAF to update a request for the transfer of analytics subscription(s) from the NF Service Consumer to the NF Service Producer (see also 3GPP TS 23.288 [17]).



Figure 4.2.2.5.3-1: NF service consumer updates a request for an analytics subscription transfer

The NF service consumer shall invoke the Nnwdaf\_EventsSubscription\_Transfer service operation to update a request for the transfer of analytics subscription(s). The NF service consumer shall send an HTTP PUT request with "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/transfers/{transferId}" as Resource URI representing the "Individual NWDAF Event Subscription Transfer", as shown in figure 4.2.2.5.3-1, step 1, to update the "Individual NWDAF Event Subscription Transfer" resource identified by the {transferId}. The AnalyticsSubscriptionsTransfer data structure provided in the request body shall include the same contents as described in subclause 4.2.2.5.2.

Upon the reception of an HTTP PUT request with: "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/transfers/{transferId}" as Resource URI and AnalyticsSubscriptionsTransfer data structure as request body, the NWDAF shall:

- if the "transReqType" attribute has the value PREPARE, perform the steps required for the preparation of an analytics subscription transfer, update the Individual NWDAF Event Subscription Transfer resource identified by "transferId", and send an HTTP "204 No Content" response, as shown in figure 4.2.2.5.3-1, step 2;

- if the "transReqType" attribute has the value TRANSFER, perform the steps required for the execution of an analytics subscription transfer, remove the Individual NWDAF Event Subscription Transfer resource identified by "transferId", and send an HTTP "204 No Content" response, as shown in figure 4.2.2.5.3-1, step 2.

Editor’s Note: References to 29.552 with regard to the steps required for the preparation and the execution of an analytics subscription transfer, and possibly also enhancement of the referencing text, will be added as soon as 29.552 has been updated accordingly.

If errors occur when processing the HTTP PUT request, the NWDAF shall send an HTTP error response as specified in subclause 5.1.7.

If the feature "ES3XX" is supported, and the NWDAF determines the received HTTP PUT request needs to be redirected, the NWDAF shall send an HTTP redirect response as specified in subclause 6.10.9 of 3GPP TS 29.500 [6].

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

##### 4.2.2.5.4 Cancel a request for analytics subscription transfer

Figure 4.2.2.5.4-1 shows a scenario where the NF service consumer (e.g. NWDAF) sends a request to the NWDAF to cancel a request for the transfer of analytics subscription(s) from the NF service consumer to the NF Service Producer (see also 3GPP TS 23.288 [17]).



Figure 4.2.2.5.4-1: NF service consumer cancels a request for an analytics subscription transfer

The NF service consumer shall invoke the Nnwdaf\_EventsSubscription\_Transfer service operation to cancel a request for the transfer of analytics subscription(s). The NF service consumer shall send an HTTP DELETE request with "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/transfers/{transferId}" as Resource URI representing the "Individual NWDAF Event Subscription Transfer", as shown in figure 4.2.2.5.4-1, step 1, to cancel the "Individual NWDAF Event Subscription Transfer" resource identified by the {transferId}.

Upon the reception of an HTTP DELETE request with: "{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/transfers/{transferId}" as Resource URI, if the NWDAF successfully processed and accepted the received HTTP DELETE request, the NWDAF shall:

- remove the corresponding Individual NWDAF Event Subscription Transfer resource; and

- respond with HTTP "204 No Content" status code, as shown in figure 4.2.2.5.4-1, step 2.

Editor’s Note: References to 29.552 with regard to the steps required upon cancelling an analytics subscription transfer, and possibly also enhancement of the referencing text, will be added as soon as 29.552 has been updated accordingly.

If errors occur when processing the HTTP DELETE request, the NWDAF shall send an HTTP error response as specified in subclause 5.1.7.

If the feature "ES3XX" is supported, and the NWDAF determines the received HTTP DELETE request needs to be redirected, the NWDAF shall send an HTTP redirect response as specified in subclause 6.10.9 of 3GPP TS 29.500 [6].

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

##### 4.3.2.2.2 Request and get from NWDAF Analytics information

Figure 4.3.2.2.2-1 shows a scenario where the NF service consumer (e.g. PCF) sends a request to the NWDAF to request and get from the NWDAF analytics information (as shown in 3GPP TS 23.288 [17]).



Figure 4.3.2.2.2-1: Requesting a NWDAF Analytics information

The NF service consumer (e.g. PCF) shall invoke the Nnwdaf\_AnalyticsInfo\_Request service operation when requesting the NWDAF analytics information. The NF service consumer shall send an HTTP GET request on the resource URI "{apiRoot}/nnwdaf-analyticsinfo/<apiVersion>/analytics" representing the "NWDAF Analytics" (as shown in figure 4.3.2.2.2-1, step 1), to request analytics data according to the query parameter value of the "event-id" attribute. In addition, the following information may be provided:

- common reporting requirement in the "ana-req" attribute as follows:

1) identification of time window for the requested analytics data applies via identification of date-time(s) in the "startTs" and "endTs" attributes;

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

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

4) maximum number of objects in the “maxObjectNbr” attribute;

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

6) identification of time when analytics information is needed in the "timeAnaNeeded" attribute;

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

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

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

Editor's Note: It is FFS to specify if the "partitionCriteria" attribute of the "ana-req" attribute may be used in this service and to implement all the corresponding changes in the API, the data model etc, as required.

For different event types:

- if the event is "LOAD\_LEVEL\_INFORMATION", it shall provide the event specific filter information within "event-filter" attribute including identification(s) of the network slice via:

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

2) any slices indication in the "anySlice" attribute.;

 and may include:

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

- if the feature "NsiLoad" is supported and the event is "NSI\_LOAD\_LEVEL", it shall provide the event specific filter information within "event-filter" attribute including identification(s) of the network slice via:

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

NOTE 1: The network slice instance of a PDU session is not available in the PCF.

2) any slices indication in the "anySlice" attribute;

 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.

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

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

NOTE 2: Only NF instances of type AMF and SMF which are serving the UE can be determined using a SUPI in "supis" attribute.

NOTE 3: 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.

- the "event-filter" attribute may provide:

a) 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;

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

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

d) optional area of interest by "networkArea" attribute; and/or

e) an optional list of analytics subsets by "listOfAnaSubsets" attribute with value(s) only applicable to NF\_LOAD event

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

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

- and may provide:

1) event specific filter information in the "event-filter" attribute:

a) identification of network area to which the subscription applies via identification of network area by "networkArea" attribute; and/or

b) if the feature "UeMobilityExt" is supported, identification of LADN DNN in the "ladnDnns" attribute;

NOTE 1: For LADN service, the consumer (e.g. SMF) provides the LADN DNN to refer the LADN service area as the AOI.

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

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

- and may provide:

1) event specific filter information in the "event-filter" attribute:

a) identification of the application as "appIds" attribute;

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

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

d) identification of network slice(s) in the "snssais" attribute; and/or

e) a list of analytics subsets carried by "listOfAnaSubsets" attribute with value(s) only applicable to "UE\_COMM" 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 "tgt-ue" attribute;

2) event specific filter information in the "event-filter" attribute which shall provide:

a) the network performance types via "nwPerfTypes" attribute;

 the "event-filter" attribute may provide:

a) 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

b) a list of analytics subsets carried by "listOfAnaSubsets" attribute with value(s) only applicable to "NETWORK\_PERFORMANCE" event, if the "EneNA" feature is supported.

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

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

2) event specific filter information in the "event-filter" attribute which shall provide:

a) 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; and

NOTE 4: The network slice instance of a PDU session is not available in the PCF.

 the "event-filter" attribute may provide:

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

b) identification of DNN via identification of Dnn(s) by "dnns" attribute;

c) identification of user plane accesses to one or more DN(s) where applications are deployed via "dnais" attribute;

d) 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);

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

f) identification of RAT type where the UE camps on by "ratTypes" attribute if the feature "ServiceExperienceExt" is also supported;

g) identification of frequency to UE’s serving cell by "freqs" attribute if the feature "ServiceExperienceExt" is also supported; and/or

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

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

1) event specific filter information in the "event-filter" attribute which shall provide:

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

b) QoS requirements via "qosRequ" attribute;

2) identification of target UE(s) to which the subscription applies by "anyUe" in the "tgt-ue" attribute;

 the "event-filter" attribute may provide:

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

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

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

2) event specific filter information in the "event-filter" attribute which shall provide

a) either the expected analytics type via "exptAnaType" attribute or a list of exception Ids via "excepIds" 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:

- 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";

- 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";

- 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 are 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 "tgt-ue" attribute sets to "true";

a) the expected analytics type via the"exptAnaType" attribute or the list of Exception Ids via "excepIds" 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 "excepIds" attribute is mobility related, at least one of identification of network area 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 "excepIds" attribute is communication related, at least one of identification of network area 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;

 the "event-filter" attribute may provide:

a) expected UE behaviour via "exptUeBehav" attribute;

- if the feature "UserDataCongestion" is supported and the event is "USER\_DATA\_CONGESTION", it shall provide one of the following attributes:

1) identification of target UE(s) via "supis" "gpsis" (if feature "UserDataCongestionExt" is supported) or "anyUe" attribute within "tgt-ue" attribute;

 and may provide:

1) event specific filter information in the "event-filter" attribute which may provide:

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

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

c) 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 bythe "maxTopAppUlNbr" attribute and/or the "maxTopAppDlNbr" attribute; and/or

d) 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.

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

1) event specific filter information in the "event-filter" attribute which shall provide:

a) identification of DNN in the "dnns" attribute; and/or

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

2) identification of target UE(s) via "supis" attribute in the "tgt-ue" attribute where the target UE(s) are one have the PDU Session for the DNN and/or S-NSSAI indicated by the event specific filter information.

 and may include:

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

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

1) identification of target UE(s) applies by “supis”, “intGroupIds” or “anyUe” attribute within “tgt-ue” attribute, “anyUe” attribute is only supported in combination with “snssais” attribute and “disperType” attribute with “DVDA” value in the request;

 and may include:

1) identification of network area applies via identification of network area by “networkArea” 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, ranking, ordering and/or accuracy requirments; and/or

5) an optional list of analytics subsets by “listOfAnaSubsets” attribute with value(s) only applicable to DISPERSION event.

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

1) identification of target UE(s) applies by "supis", "intGroupIds" or "anyUe" attribute within "tgt-ue" attribute;

 and may include:

1) identification of network area 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; and/or

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

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

1) identification of target UE(s) by "supis", "intGroupIds" or "anyUe" attribute in the "tgt-Ue" attribute. If "anyUe" attribute is included in the "tgt-Ue" attribute, then any of "networkArea" attribute, "ssIds" or "bssIds" attribute shall be present in the "wlanReqs" attribute;

 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 "upfId" attribute;

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

9) 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.

Upon the reception of the HTTP GET request, the NWDAF shall:

- analyse the requested analytic data according to the requested event.

If the HTTP request message from the NF service consumer is accepted, the NWDAF shall respond with "200 OK" status code with the message body containing the analytics with parameters as relevant for the requesting NF service consumer. The AnalyticsData data structure in the response body shall include:

- analytics with the corresponding information as described in subclause 4.2.2.4.2.

If the request NWDAF Analytics data does not exist, the NWDAF shall respond with "204 No Content" status code.

If the "timeAnaNeeded" attribute within EventReportingRequirement is provided during the request, if the time is reached but the requested analytics information is not ready, the consumer does not need to wait for the analytics information any longer, the NWDAF may send a "500 Internal Server Error" status code to the NF service consumer. In addition, if the EneNA feature is supported, the NWDAF may provide, within the ReqFailureCause data in the response, the corresponding failure reason via a "problemDetails" attribute with the "cause" attribute set to "UNSATISFIED\_REQUESTED\_ANALYTICS\_TIME" and a minimum time interval recommended by the NWDAF via a "rvWaitTime" attribute which is used by the NF service consumer to determine the time when analytics information is needed in similar future analytics requests.

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

##### 4.3.2.3.2 Request and get from NWDAF context of a subscription

Figure 4.3.2.3.2-1 shows a scenario where the NF service consumer (e.g. NWDAF) sends a request to the NWDAF to request and get from NWDAF context information related to analytics subscriptions (see also 3GPP TS 23.288 [17]).



Figure 4.3.2.3.2-1: Requesting NWDAF context information related to analytics subscriptions

The NF service consumer (e.g. NWDAF) shall invoke the Nnwdaf\_AnalyticsInfo\_ContextTransfer service operation when requesting context information related to analytics subscriptions. The NF service consumer shall send an HTTP GET request on the resource URI "{apiRoot}/nnwdaf-analyticsinfo/<apiVersion>/context" representing the "NWDAF Context" (as shown in figure 4.3.2.3.2-1, step 1), to request context information related to analytics subscriptions according to the query parameter values of the attributes "context-ids" and "req-context".

Upon the reception of the HTTP GET request, the NWDAF shall retrieve the context information for the requested context identifiers.

If the HTTP request message from the NF service consumer is accepted, the NWDAF shall respond with "200 OK" status code with the message body containing the retrieved context information. The ContextData data structure in the response body shall include for each of the context elements contained in the "contextElems" attribute:

- the context identifier that this context element refers to in the "contextId" attribute, which indicates among others the analytics subscription that this context element is associated with.

- the pending output analytics for the indicated analytics subscription in the "pendAnalytics" attribute if such analytics are available and the NF service consumer has indicated the "PENDING\_ANALYTICS" context type in the "req-context" attribute of the request.

- the historical output analytics for the indicated analytics subscription in the "histAnalytics" attribute if such analytics are available and the NF service consumer has indicated the "HISTORICAL\_ANALYTICS" context type in the "req-context" attribute of the request.

- a timestamp of the last provided output analytics in the "lastOutputTime" if the NF service consumer has indicated the "PENDING\_ANALYTICS" and/or "HISTORICAL\_ANALYTICS" context type in the "req-context" attribute of the request and output analytics had been provided to the analytics consumer.

Editor's Note: It is FFS to add the information about subscriptions with the data sources that are related to the analytics.

- information about aggregation related analytics subscriptions that the NWDAF has with other NWDAFs in the "aggrSubs" attribute if such subscriptions exist and the NF service consumer has indicated the "AGGR\_SUBS" context type in the "req-context" attribute of the request.

- historical data related to the indicated analytics subscription in the "histData" attribute if such data exists and the NF service consumer has indicated the "DATA" context type in the "req-context" attribute of the request.

- identifier of ADRF instance in the "adrfId" attribute if the NWDAF stores data in the ADRF.

- the types of data stored in the ADRF in the "adrfDataTypes" attribute if the "adrfId" attribute is provided.

- identifiers of NWDAF instances used when aggregating multiple analytics subscriptions in the "aggrNwdafIds" if such information is available and the NF service consumer has indicated the "AGGR\_INFO" context type in the "req-context" attribute of the request.

- identifiers of NWDAFs that provide ML models in the "modelProvIds" attribute if such information is available and the NF service consumer has indicated the "ML\_MODELS" context type in the "req-context" attribute of the request.

If the requested context information does not exist, the NWDAF shall respond with "204 No Content" status code.

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

##### 4.4.2.2.2 Subscription for data or analytics notifications

Figure 4.4.2.2.2-1 shows a scenario where the NF service consumer sends a request to the NWDAF to subscribe for data or analytics notification(s) (as shown in 3GPP TS 23.288 [17]).



Figure 4.4.2.2.2-1: NF service consumer subscribes to data or analytics notifications

The NF service consumer shall invoke the Nnwdaf\_DataManagement \_Subscribe service operation to subscribe to data or anaytics notification(s). The NF service consumer shall send an HTTP POST request with "{apiRoot}/nnwdaf-datamanagement/<apiVersion>/subscriptions" as Resource URI representing the "NWDAF Data Management Subscriptions", as shown in figure 4.4.2.2.2-1, step 1, to create a subscription for an "Individual NWDAF Data Management Subscription" according to the information in message body.

The NnwdafDataManagementSubsc data structure provided in the request body shall include:

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

- notification correlation identfier within the "notifCorrId" attribute; and

- one of the following:

- analytics subscription notification(s) within the "anaSub" attribute;

- data subscription notification(s) within the "dataSub" attribute;

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

- formatting instructions within the "formatInstruct" attribute;

- processing instructions within the "procInstrct" attribute;

- one of the following identifiers related to the NF service consumer:

- NWDAF instance identifier within the "nwdafId" attribute;

- ADRF instance identifier within the "adrfId" attribute;

- NWDAF set identifier within the "nwdafSetId" attribute;

- ADRF set identifier within the "adrfSetId" attribute;

- one of the following target identifiers:

- NF instance identifier within the "targetNfId" attribute;

- NF set identifier within the "targetNfSetId" attribute.

Upon the reception of an HTTP POST request with: "{apiRoot}/nnwdaf-datamanagement/<apiVersion>/subscriptions" as Resource URI and NnwdafDataManagementSubsc data structure as request body, the NWDAF shall:

- create a new subscription;

- assign a subscriptionId;

- store the subscription.

If the NWDAF created an "Individual NWDAF Data Management Subscription" resource, the NWDAF shall respond with "201 Created" with the message body containing a representation of the created subscription, as shown in figure 4.4.2.2.2-1, step 2. 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-datamanagement/<apiVersion>/subscriptions/{subscriptionId}".If an error occurs when processing the HTTP POST request, the NWDAF shall send an HTTP error response as specified in subclause 5.3.7.

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

##### 4.4.2.2.3 Update subscription for data or analytics notifications

Figure 4.4.2.2.3-1 shows a scenario where the NF service consumer sends a request to the NWDAF to update the subscription for data or analytics notifications (see also 3GPP TS 23.288 [17]).



Figure 4.4.2.2.3-1: NF service consumer updates subscription to data or analytics notifications

The NF service consumer shall invoke the Nnwdaf\_DataManagement\_Subscribe service operation to update subscription to data or analytics notifications. The NF service consumer shall send an HTTP PUT request with "{apiRoot}/nnwdaf-datamanagement/<apiVersion>/subscriptions/{subscriptionId}" as Resource URI representing the "Individual NWDAF Data Management Subscription", as shown in figure 4.4.2.2.3-1, step 1, to update the subscription for an "Individual NWDAF Data Management Subscription" resource identified by the {subscriptionId}. The NnwdafDataManagementSubsc data structure provided in the request body shall include the same contents as described in subclause 4.2.2.2.2.

Upon the reception of an HTTP PUT request with: "{apiRoot}/nnwdaf-datamanagement/<apiVersion>/subscriptions/{subscriptionId}" as Resource URI and NnwdafDataManagementSubsc data structure as request body, the NWDAF shall:

- update the subscription of corresponding subscriptionId; and

- store the subscription.

If the NWDAF successfully processed and accepted the received HTTP PUT request, the NWDAF shall update an "Individual NWDAF Data Management Subscription" resource, and shall respond with:

a) HTTP "200 OK" status code with the message body containing a representation of the updated subscription, as shown in figure 4.4.2.2.3-1, step 2a; or

b) HTTP "204 No Content" status code, as shown in figure 4.4.2.2.3-1, step 2b.

If errors occur when processing the HTTP PUT request, the NWDAF shall send an HTTP error response as specified in subclause 5.3.7.

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

##### 4.4.2.3.2 Unsubscribe from data or analytics notifications

Figure 4.4.2.3.2-1 shows a scenario where the NF service consumer sends a request to the NWDAF to unsubscribe from data or analytics notifications (see also 3GPP TS 23.288 [17]).



Figure 4.4.2.3.2-1: NF service consumer unsubscribes from data or analytics notifications

The NF service consumer shall invoke the Nnwdaf\_DataManagement\_Unsubscribe service operation to unsubscribe from data or analytics notifications. The NF service consumer shall send an HTTP DELETE request with: "{apiRoot}/nnwdaf-datamanagement/<apiVersion>/subscriptions/{subscriptionId}" as Resource URI, where "{subscriptionId}" is the identifier of the existing subscription that is to be deleted.

Upon the reception of an HTTP DELETE request, if the NWDAF successfully processed and accepted the received HTTP DELETE request, the NWDAF shall:

- remove the corresponding subscription;

- respond with HTTP "204 No Content" status.

If errors occur when processing the HTTP DELETE request, the NWDAF shall send an HTTP error response as specified in subclause 5.3.7.

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

##### 4.5.2.2.2 Subscription for event notifications

Figure 4.5.2.2.2-1 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 4.5.2.2.2-1: NF service consumer subscribes to notifications

The NF service consumer shall invoke the Nnwdaf\_MLModelProvision\_Subscribe service operation to subscribe to event notification(s). The NF service consumer shall send an HTTP POST request with "{apiRoot}/nnwdaf-mlmodelprovision/<apiVersion>/subscriptions" as Resource URI representing the "NWDAF ML Model Provision Subscriptions", as shown in figure 4.5.2.2.2-1, step 1, to create a subscription for an "Individual NWDAF ML Model Provision Subscription" according to the information in message body.

The NwdafMLModelProvSubsc data structure provided in the request body shall include:

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

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

1) an event identifier as the "mLEvent" attribute;

2) event filter information as the "mLEventFilter" attirbute; and

and may include:

1) an identification of target UE information as the "tgtUe" attribute; and

2) a time interval during which the ML model shall be reported as the "mLTargetPeriod" attirbute.

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

- a notification correlation identifier assigned by the NF service consumer for the requested notifications as "notifCorreId" attribute; and

- the reporting requirement information of the subscription as the "eventReq" attribute.

For different event types, the "mLEventFilter" attribute within the MLEventSubscription data type:

- if the event is "LOAD\_LEVEL\_INFORMATION", shall provide

Editor’s Note: The mandatory and optional information is FFS for the LoadLevelInformation feature.

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

1) the S-NSSAI as the "snssais" attribute; and/or

2) the identification(s) of Network Slice instance as the "nsiIdInfos" attribute;

and may provide:

1) an optional list of analytics subsets as the "listOfAnaSubsets" attribute.

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

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

2) the S-NSSAI as the "snssais" attribute;

3) the identification(s) of Network Slice instance as the "nsiIdInfos" attribute;

4) the Area of Interest (AOI) as the "networkArea" attribute;

5) the identification of DNN as the "dnns" attribute;

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

7) identification of RAT type where the UE camps on by "ratTypes" attribute if the feature "ServiceExperienceExt" is also supported; and

8) identification of frequency to UE’s serving cell by "freqs" attribute if the feature "ServiceExperienceExt" is also supported.

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

1) Area of Interest (AOI) as the "networkArea" attribute; and

2) Visited Area(s) of Interest as the "visitedAreas" attirbute.

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

1) the S-NSSAI as the "snssais" attribute;

2) the identification of DNN as the "dnns" attribute;

3) the identification of the application as the "appIds" attribute;

4) the Area of Interest (AOI) as the "networkArea" attribute; and

5) an optional list of analytics subsets as the "listOfAnaSubsets" attribute.

Editor’s Note: Whether the analytics subsets can be provided in the ML model filter is FFS.- if the QoSSustainability feature is supported and the event is "QOS\_SUSTAINABILITY", shall provide:

1) The QoS requirements via "qosRequ" attribute; and

2) Location information as "networkArea" attribute;

 and may provide:

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

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

1) the S-NSSAI as the "snssais" attribute;

2) the identification of DNN as the "dnns" attribute;

3) the identification of the application as the "appIds" attribute;

4) the Area of Interest (AOI) as the "networkArea" attribute;

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

6) either the expected analytics type via "exptAnaType" attribute or a list of exception Ids with the associated thresholds via "excepRequs" attribute.

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

1) the Area of Interest (AOI) as the "networkArea" attribute;

2) an optional list of analytics subsets as the "listOfAnaSubsets" attribute; and

3) the S-NSSAI as the "snssais" attribute.

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

1) the S-NSSAI as the "snssais" attribute;

2) either list of NF instance IDs in the "nfInstanceIds" attribute or list of NF set IDs in the "nfSetIds" attribute;

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

4) the Area of Interest (AOI) as the "networkArea" attribute; and

5) an optional list of analytics subsets as the "listOfAnaSubsets" attribute.

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

1) Area of Interest (AOI) as the "networkArea" attribute; and

2) an optional list of analytics subsets as the "listOfAnaSubsets" attribute.

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

1) the S-NSSAI as the "snssais" attribute; and/or

2) the identification(s) of Network Slice instance as the "nsiIdInfos" attribute;

 and may provide:

1) an optional list of analytics subsets as the "listOfAnaSubsets" attribute.

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

1) the S-NSSAI as the "snssais" attribute; and/or

2) the identification of DNN as the "dnns" attribute;

 and may provide:

1) an optional list of analytics subsets as the "listOfAnaSubsets" attribute.

- if the RedundantTransmission feature is supported and the event is "REDUNDANT\_TRANSMISSION", may provide:

1) the Area of Interest (AOI) as the "networkArea" attribute;

2) the S-NSSAI as the "snssais" attribute; and

3) the identification of DNN as the "dnns" attribute.

- if the WLANPerformance feature is supported and the event is "WLAN\_PERFORMANCE", may provide:

1) the Area of Interest (AOI) as the "networkArea" attribute;

2) the SSID(s) and BSSID(s) as "wlanReqs" attribute; and

3) an optional list of analytics subsets as the "listOfAnaSubsets" attribute.

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

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

2) the S-NSSAI as the "snssais" attribute;

3) the identification(s) of Network Slice instance as the "nsiIdInfos" attribute;

4) the Area of Interest (AOI) as the "networkArea" attribute;

5) the identification of the UPF as the "upfId" attribute;

6) the identification of DNN as the "dnns" attribute;

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

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

9) an optional list of analytics subsets as the "listOfAnaSubsets" attribute.- if the Dispersion feature is supported and the event is "DISPERSION", may provide:

1) the Area of Interest (AOI) as the "networkArea" attribute;

2) the S-NSSAI as the "snssais" attribute;

3) the identification of the application as the "appIds" attribute;

4) dispersion analytics requirements in "disperReqs" attribute;

5) an optional list of analytics subsets as the "listOfAnaSubsets" attribute.

Upon the reception of an HTTP POST request with: "{apiRoot}/nnwdaf-mlmodelprovision/<apiVersion>/subscriptions" as Resource URI and NwdafMLModelProvSubsc data structure as request body, the NWDAF shall create a new subscription and store the subscription.

If the NWDAF created an "Individual NWDAF ML Model Provision Subscription" resource, the NWDAF shall respond with "201 Created" with the message body containing a representation of the created subscription, as shown in figure 4.5.2.2.2-1, step 2. 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-mlmodelprovision/<apiVersion>/subscriptions/{subscriptionId}".

If the immediate reporting indication in the "immRep" attribute within the "evtReq" attribute sets to true during the event subscription, the NWDAF shall include the reports of the subscribed events, if available, as the "mLEventNotifs" attribute in the HTTP POST response.

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

##### 4.5.2.2.3 Update subscription for event notifications

Figure 4.5.2.2.3-1 shows a scenario that the NF service consumer sends an HTTP PUT request to the NWDAF to modify an existing subscription (as shown in 3GPP TS 23.288 [17]).



Figure 4.5.2.2.3-1: Modification of events subscription information using HTTP PUT

The NF service consumer shall invoke the Nnwdaf\_MLModelProvision\_Subscribe service operation to modify an existing ML Model subscription. The NF service consumer shall send an HTTP PUT request with: "{apiRoot}/nnwdaf-mlmodelprovision/<apiVersion>/subscriptions/{subscriptionId}" as Resource URI, where "{subscriptionId}" is the event subscriptionId of the existing subscription to be modified, to update an "Individual NWDAF ML Model Provision Subscription" according to the information in the message body. The NwdafMLModelProvSubsc data structure provided in the request body shall include the same contents as described in subclause 4.5.2.2.2.

Upon receipt of an HTTP PUT request with: "{apiRoot}/nnwdaf-mlmodelprovision/<apiVersion>/subscriptions/{subscriptionId}" as Resource URI and NwdafMLModelProvSubsc data type as request body, if the request is successfully processed and accepted, the NWDAF shall:

- modify the concerned subscription; and

- store the subscription.

NOTE: The "notifUri" attribute within the NwdafMLModelProvSubsc data structure can be modified to request that subsequent notifications are sent to a new NF service consumer.

If the NWDAF successfully processed and accepted the received HTTP PUT request, the NWDAF shall update an "Individual NWDAF ML Model Provision Subscription" resource, and shall respond with:

- HTTP "204 No Content" response (as shown in figure 4.5.2.2.3-1, step 2a); or

- HTTP "200 OK" response (as shown in figure 4.5.2.2.3-1, step 2b) with a response body containing a representation of the updated subscription in the NwdafMLModelProvSubsc data type.

If errors occur when processing the HTTP PUT request, the NWDAF shall send an HTTP error response as specified in subclause 5.4.7.

If the feature "ES3XX" is supported, and the NWDAF determines that the received HTTP PUT request needs to be redirected, the NWDAF shall send an HTTP redirect response as specified in subclause 6.10.9 of 3GPP TS 29.500 [6].

Editor’s Note: It’s FFS that whether PATCH is also possible for partial update.

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

##### 4.5.2.3.2 Unsubscribe from event notifications

Figure 4.5.2.3.2-1 shows a scenario where the NF service consumer sends a request to the NWDAF to unsubscribe from event notifications (see also 3GPP TS 23.288 [17]).



Figure 4.5.2.3.2-1: NF service consumer unsubscribes from notifications

The NF service consumer shall invoke the Nnwdaf\_MLModelProvision\_UnSubscribe service operation to unsubscribe to event notifications. The NF service consumer shall send an HTTP DELETE request with: "{apiRoot}/nnwdaf-mlmodelprovision/<apiVersion>/subscriptions/{subscriptionId}" as Resource URI, where "{subscriptionId}" is the event subscriptionId of the existing subscription that is to be deleted.

Upon the reception of an HTTP DELETE request, if the NWDAF successfully processed and accepted the received HTTP DELETE request, the NWDAF shall:

- remove the corresponding subscription; and

- respond with HTTP "204 No Content" status code.

If the feature "ES3XX" is supported, and the NWDAF determines the received HTTP DELETE request needs to be redirected, the NWDAF shall send an HTTP redirect response as specified in subclause 6.10.9 of 3GPP TS 29.500 [6].

If the Individual NWDAF ML Model Provision Subscription resource does not exist, the NWDAF shall respond with "404 Not Found" status code.

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

#### 5.1.3.1 Resource Structure

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 5.1.3.1-1 depicts the resource URIs structure for the Nnwdaf\_EventsSubscription API.



Figure 5.1.3.1-1: Resource URI structure of the Nnwdaf\_EventsSubscription API

Table 5.1.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 5.1.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| NWDAF Events Subscriptions | /subscriptions | POST | Creates a new Individual NWDAF Event Subscription resource. |
| Individual NWDAF Event Subscription | /subscriptions/{subscriptionId} | DELETE | Deletes an Individual NWDAF Event Subscription identified by subresource {subscriptionId}. |
| PUT | Modifies an existing Individual Event Subscription subresource. |
| NWDAF Event Subscription Transfers | /transfers | POST | Provides information about the requested analytics subscription transfer(s), potentially creating a new Individual NWDAF Event Subscription Transfer resource. |
| Individual NWDAF Event Subscription Transfer | /transfers/{transferId} | DELETE | Deletes an Individual NWDAF Event Subscription Transfer resource identified by subresource {transferId}. |
| PUT | Modifies an existing Individual NWDAF Event Subscription Transfer resource. |

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

##### 5.1.3.2.2 Resource definition

Resource URI: **{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions**

The <apiVersion> shall be set as described in clause 5.1.1.

This resource shall support the resource URI variables defined in table 5.1.3.2.2-1.

Table 5.1.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.1.1 |

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

###### 5.1.3.2.3.1 POST

This method shall support the URI query parameters specified in table 5.1.3.2.3.1-1.

Table 5.1.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 5.1.3.2.3.1-2 and the response data structures and response codes specified in table 5.1.3.2.3.1-3.

Table 5.1.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NnwdafEventsSubscription | M | 1 | Creates a new Individual NWDAF Event Subscription resource. |

Table 5.1.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| NnwdafEventsSubscription | M | 1 | 201 Created | The creation of an Individual NWDAF Event Subscription resource is confirmed and a representation of that resource is returned. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] also apply. |

Table 5.1.3.2.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/nnwdaf-eventssubscription/<apiVersion>/subscriptions/{subscriptionId}. |

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

##### 5.1.3.3.2 Resource definition

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

The <apiVersion> shall be set as described in clause 5.1.1.

This resource shall support the resource URI variables defined in table 5.1.3.3.2-1.

Table 5.1.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.1.1. |
| subscriptionId | string | Identifies a subscription to the Nnwdaf\_EventsSubscription service. |

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

##### 5.1.3.4.2 Resource definition

Resource URI: **{apiRoot}/nnwdaf-eventssubscription/<apiVersion>/transfers**

The <apiVersion> shall be set as described in clause 5.1.1.

This resource shall support the resource URI variables defined in table 5.1.3.4.2-1.

Table 5.1.3.4.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.1.1 |

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

###### 5.1.3.4.3.1 POST

This method shall support the URI query parameters specified in table 5.1.3.4.3.1-1.

Table 5.1.3.4.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 5.1.3.4.3.1-2 and the response data structures and response codes specified in table 5.1.3.4.3.1-3.

Table 5.1.3.4.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| AnalyticsSubscriptionsTransfer | M | 1 | Information about analytics subscription(s) that are requested to be transferred or prepared for transfer. |

Table 5.1.3.4.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| AnalyticsSubscriptionsTransfer | M | 1 | 201 Created | The creation of an Individual NWDAF Event Subscription resource is confirmed and a representation of that resource is returned. |
| n/a |  |  | 204 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. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] also apply. |

Table 5.1.3.4.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/nnwdaf-eventssubscription/<apiVersion>/transfers/{transferId}. |

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

##### 5.1.3.5.2 Resource definition

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

The <apiVersion> shall be set as described in clause 5.1.1.

This resource shall support the resource URI variables defined in table 5.1.3.5.2-1.

Table 5.1.3.5.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.1.1. |
| transferId | string | Identifies a request to transfer subscription(s) of the Nnwdaf\_EventsSubscription service. |

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

#### 5.2.3.1 Resource Structure

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 5.2.3.1-1 depicts the resource URIs structure for the Nnwdaf\_AnalyticsInfo API.



Figure 5.2.3.1-1: Resource URI structure of the Nnwdaf\_AnalyticsInfo API

Table 5.2.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 5.2.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| NWDAF Analytics | /analytics | GET | Retrieves the NWDAF analytics. |
| NWDAF Context | /context  | GET | Retrieves the NWDAF context information related to analytics subscriptions. |

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

##### 5.2.3.2.2 Resource definition

Resource URI: {apiRoot}/nnwdaf-analyticsinfo/<apiVersion>/analytics

The <apiVersion> shall be set as described in clause 5.2.1.

This resource shall support the resource URI variables defined in table 5.2.3.2.2-1.

Table 5.2.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.2.1 |

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

##### 5.2.3.3.2 Resource definition

Resource URI: {apiRoot}/nnwdaf-analyticsinfo/<apiVersion>/context

The <apiVersion> shall be set as described in clause 5.2.1.

This resource shall support the resource URI variables defined in table 5.2.3.3.2-1.

Table 5.2.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.2.1 |

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

#### 5.3.3.1 Resource Structure

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 5.3.3.1-1 depicts the resource URIs structure for the Nnwdaf\_DataManagement API.



Figure 5.3.3.1-1: Resource URI structure of the Nnwdaf\_DataManagement API

Table 5.3.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 5.3.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| NWDAF Data Management Subscriptions | /subscriptions | POST | Creates a new Individual NWDAF Data Management Subscription resource. |
| Individual NWDAF Data Management Subscription | /subscriptions/{subscriptionId} | DELETE | Deletes an Individual NWDAF Data Management Subscription identified by subresource {subscriptionId}. |
| PUT | Modifies an existing Individual NWDAF Data Management Subscription identified by subresource {subscriptionId}. |

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

##### 5.3.3.2.2 Resource Definition

Resource URI: **{apiRoot}/nnwdaf-datamanagement/<apiVersion>/subscriptions**

The <apiVersion> shall be set as described in clause 5.3.1.

This resource shall support the resource URI variables defined in table 5.3.3.2.2-1.

Table 5.3.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.3.1 |

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

###### 5.3.3.2.3.1 POST

This method shall support the URI query parameters specified in table 5.3.3.2.3.1-1.

Table 5.3.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 5.3.3.2.3.1-2 and the response data structures and response codes specified in table 5.3.3.2.3.1-3.

Table 5.3.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NnwdafDataManagementSubsc | M | 1 | Create a new Individual NWDAF Data Management Subscription resource. |

Table 5.3.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| NnwdafDataManagementSubsc | M | 1 | 201 Created | The creation of an Individual NWDAF Data Management Subscription resource is confirmed and a representation of that resource is returned. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] also apply. |

Table 5.3.3.2.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/nnwdaf-datamanagement/<apiVersion>/subscriptions/{subscriptionId} |

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

##### 5.3.3.3.2 Resource definition

Resource URI: **{apiRoot}/nnwdaf-datamanagement/<apiVersion>/subscriptions/{subscriptionId}**

The <apiVersion> shall be set as described in clause 5.3.1.

This resource shall support the resource URI variables defined in table 5.3.3.3.2-1.

Table 5.3.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.3.1 |
| subscriptionId | string | Identifies a subscription to the Nnwdaf\_DataManagement Service |

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

#### 5.4.3.1 Resource Structure

This clause describes the structure for the Resource URIs and the resources and methods used for the service.

Figure 5.4.3.1-1 depicts the resource URIs structure for the Nnwdaf\_MLModelProvision API.



Figure 5.4.3.1-1: Resource URI structure of the Nnwdaf\_MLModelProvision API

Table 5.4.3.1-1 provides an overview of the resources and applicable HTTP methods.

Table 5.4.3.1-1: Resources and methods overview

|  |  |  |  |
| --- | --- | --- | --- |
| Resource name | Resource URI | HTTP method or custom operation | Description |
| NWDAF ML Model Provision Subscriptions | /subscriptions | POST | Creates a new Individual NWDAF ML Model Provision Subscription resource. |
| Individual NWDAF ML Model Provision Subscription | /subscriptions/{subscriptionId} | DELETE | Deletes an Individual NWDAF ML Model Provision Subscription identified by subresource {subscriptionId}. |
| PUT | Modifies an existing Individual NWDAF ML Model Provision Subscription identified by subresource {subscriptionId}. |

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

##### 5.4.3.2.2 Resource definition

Resource URI: **{apiRoot}/nnwdaf-mlmodelprovision/<apiVersion>/subscriptions**

The <apiVersion> shall be set as described in clause 5.4.1.

This resource shall support the resource URI variables defined in table 5.4.3.2.2-1.

Table 5.4.3.2.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.4.1 |

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

###### 5.4.3.2.3.1 POST

This method shall support the URI query parameters specified in table 5.4.3.2.3.1-1.

Table 5.4.3.2.3.1-1: URI query parameters supported by the POST method on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| n/a |  |  |  |  |

This method shall support the request data structures specified in table 5.4.3.2.3.1-2 and the response data structures and response codes specified in table 5.4.3.2.3.1-3.

Table 5.4.3.2.3.1-2: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| NwdafMLModelProvSubsc | M | 1 | Creates a new Individual NWDAF ML Model Provision Subscription resource. |

Table 5.4.3.2.3.1-3: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| NwdafMLModelProvSubsc | M | 1 | 201 Created | The creation of an Individual NWDAF ML Model Provision Subscription resource is confirmed and a representation of that resource is returned. |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.7.1-1 of 3GPP TS 29.500 [6] also apply. |

Table 5.4.3.2.3.1-4: Headers supported by the 201 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | Contains the URI of the newly created resource, according to the structure: {apiRoot}/nnwdaf-mlmodelprovision/<apiVersion>/subscriptions/{subscriptionId} |

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

##### 5.4.3.3.2 Resource definition

Resource URI: **{apiRoot}/nnwdaf-mlmodelprovision/<apiVersion>/subscriptions/{subscriptionId}**

This resource shall support the resource URI variables defined in table 5.4.3.3.2-1.

Table 5.4.3.3.2-1: Resource URI variables for this resource

|  |  |  |
| --- | --- | --- |
| Name | Data type | Definition |
| apiRoot | string | See subclause 5.4.1. |
| subscriptionId | string | Identifies a subscription to the Nnwdaf\_MLModelProvision service. |

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

# A.2 Nnwdaf\_EventsSubscription API

openapi: 3.0.0

info:

 version: 1.2.0-alpha.7

 title: Nnwdaf\_EventsSubscription

 description: |

 Nnwdaf\_EventsSubscription Service API.

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externalDocs:

 description: 3GPP TS 29.520 V17.6.0; 5G System; Network Data Analytics Services.

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

security:

 - {}

 - oAuth2ClientCredentials:

 - nnwdaf-eventssubscription

servers:

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

 variables:

 apiRoot:

 default: https://example.com

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

paths:

 /subscriptions:

 post:

 summary: Create a new Individual NWDAF Events Subscription

 operationId: CreateNWDAFEventsSubscription

 tags:

 - NWDAF Events Subscriptions (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: Create a new Individual NWDAF Event Subscription resource.

 headers:

 Location:

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

 '503':

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

 default:

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

 callbacks:

 myNotification:

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

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 1

 responses:

 '204':

 description: The receipt of the Notification is acknowledged.

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 /subscriptions/{subscriptionId}:

 delete:

 summary: Delete an existing Individual NWDAF Events Subscription

 operationId: DeleteNWDAFEventsSubscription

 tags:

 - Individual NWDAF Events Subscription (Document)

 parameters:

 - name: subscriptionId

 in: path

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

 required: true

 schema:

 type: string

 responses:

 '204':

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

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 content:

 application/problem+json:

 schema:

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

 '429':

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

 '500':

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

 '501':

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

 '503':

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

 default:

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

 put:

 summary: Update an existing Individual NWDAF Events Subscription

 operationId: UpdateNWDAFEventsSubscription

 tags:

 - Individual NWDAF Events Subscription (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 parameters:

 - name: subscriptionId

 in: path

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

 required: true

 schema:

 type: string

 responses:

 '200':

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

 content:

 application/json:

 schema:

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

 '204':

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

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 content:

 application/problem+json:

 schema:

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '501':

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

 '503':

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

 default:

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

 /transfers:

 post:

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

 operationId: CreateNWDAFEventSubscriptionTransfer

 tags:

 - NWDAF Event Subscription Transfers (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

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

 headers:

 Location:

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

 required: true

 schema:

 type: string

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 /transfers/{transferId}:

 delete:

 summary: Delete an existing Individual NWDAF Event Subscription Transfer

 operationId: DeleteNWDAFEventSubscriptionTransfer

 tags:

 - Individual NWDAF Event Subscription Transfer (Document)

 parameters:

 - name: transferId

 in: path

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

 required: true

 schema:

 type: string

 responses:

 '204':

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

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '429':

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

 '500':

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

 '501':

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

 '503':

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

 default:

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

 put:

 summary: Update an existing Individual NWDAF Event Subscription Transfer

 operationId: UpdateNWDAFEventSubscriptionTransfer

 tags:

 - Individual NWDAF Event Subscription Transfer (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 parameters:

 - name: transferId

 in: path

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

 required: true

 schema:

 type: string

 responses:

 '204':

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

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '501':

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

 '503':

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

 default:

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

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 nnwdaf-eventssubscription: Access to the Nnwdaf\_EventsSubscription API

 schemas:

 NnwdafEventsSubscription:

 description: Represents an Individual NWDAF Event Subscription resource.

 type: object

 properties:

 eventSubscriptions:

 type: array

 items:

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

 minItems: 1

 description: Subscribed events

 evtReq:

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

 notificationURI:

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

 supportedFeatures:

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

 eventNotifications:

 type: array

 items:

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

 minItems: 1

 failEventReports:

 type: array

 items:

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

 minItems: 1

 prevSub:

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

 consNfInfo:

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

 required:

 - eventSubscriptions

 EventSubscription:

 description: Represents a subscription to a single event.

 type: object

 properties:

 anySlice:

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

 appIds:

 type: array

 items:

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

 minItems: 1

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

 dnns:

 type: array

 items:

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

 minItems: 1

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

 dnais:

 type: array

 items:

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

 minItems: 1

 event:

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

 extraReportReq:

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

 ladnDnns:

 type: array

 items:

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

 minItems: 1

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

 loadLevelThreshold:

 type: integer

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

 notificationMethod:

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

 matchingDir:

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

 nfLoadLvlThds:

 type: array

 items:

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

 minItems: 1

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

 nfInstanceIds:

 type: array

 items:

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

 minItems: 1

 nfSetIds:

 type: array

 items:

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

 minItems: 1

 nfTypes:

 type: array

 items:

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

 minItems: 1

 networkArea:

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

 visitedAreas:

 type: array

 items:

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

 minItems: 1

 maxTopAppUlNbr:

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

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

 maxTopAppDlNbr:

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

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

 nsiIdInfos:

 type: array

 items:

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

 minItems: 1

 nsiLevelThrds:

 type: array

 items:

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

 minItems: 1

 qosRequ:

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

 qosFlowRetThds:

 type: array

 items:

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

 minItems: 1

 ranUeThrouThds:

 type: array

 items:

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

 minItems: 1

 repetitionPeriod:

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

 snssaia:

 type: array

 items:

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

 minItems: 1

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

 tgtUe:

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

 congThresholds:

 type: array

 items:

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

 minItems: 1

 nwPerfRequs:

 type: array

 items:

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

 minItems: 1

 bwRequs:

 type: array

 items:

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

 minItems: 1

 excepRequs:

 type: array

 items:

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

 minItems: 1

 exptAnaType:

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

 exptUeBehav:

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

 ratTypes:

 type: array

 items:

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

 minItems: 1

 freqs:

 type: array

 items:

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

 minItems: 1

 listOfAnaSubsets:

 type: array

 items:

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

 minItems: 1

 disperReqs:

 type: array

 items:

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

 minItems: 1

 redTransReqs:

 type: array

 items:

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

 minItems: 1

 wlanReqs:

 type: array

 items:

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

 minItems: 1

 upfId:

 type: string

 description: Identifies the UPF.

 appServerAddrs:

 type: array

 items:

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

 minItems: 1

 dnPerfReqs:

 type: array

 items:

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

 minItems: 1

 required:

 - event

 NnwdafEventsSubscriptionNotification:

 description: Represents an Individual NWDAF Event Subscription Notification resource.

 type: object

 properties:

 eventNotifications:

 type: array

 items:

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

 minItems: 1

 description: Notifications about Individual Events

 subscriptionId:

 type: string

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

 required:

 - eventNotifications

 - subscriptionId

 EventNotification:

 description: Represents a notification on events that occurred.

 type: object

 properties:

 event:

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

 start:

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

 expiry:

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

 timeStampGen:

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

 failNotifyCode:

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

 rvWaitTime:

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

 anaMetaInfo:

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

 nfLoadLevelInfos:

 type: array

 items:

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

 minItems: 1

 nsiLoadLevelInfos:

 type: array

 items:

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

 minItems: 1

 sliceLoadLevelInfo:

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

 svcExps:

 type: array

 items:

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

 minItems: 1

 qosSustainInfos:

 type: array

 items:

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

 minItems: 1

 ueComms:

 type: array

 items:

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

 minItems: 1

 ueMobs:

 type: array

 items:

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

 minItems: 1

 userDataCongInfos:

 type: array

 items:

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

 minItems: 1

 abnorBehavrs:

 type: array

 items:

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

 minItems: 1

 nwPerfs:

 type: array

 items:

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

 minItems: 1

 dnPerfInfos:

 type: array

 items:

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

 minItems: 1

 disperInfos:

 type: array

 items:

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

 minItems: 1

 redTransInfos:

 type: array

 items:

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

 minItems: 1

 wlanInfos:

 type: array

 items:

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

 minItems: 1

 required:

 - event

 ServiceExperienceInfo:

 description: Represents service experience information.

 type: object

 properties:

 svcExprc:

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

 svcExprcVariance:

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

 supis:

 type: array

 items:

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

 minItems: 1

 snssai:

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

 appId:

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

 srvExpcType:

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

 confidence:

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

 dnn:

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

 networkArea:

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

 nsiId:

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

 ratio:

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

 ratType:

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

 frequency:

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

 required:

 - svcExprc

 BwRequirement:

 description: Represents bandwidth requirements.

 type: object

 properties:

 appId:

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

 marBwDl:

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

 marBwUl:

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

 mirBwDl:

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

 mirBwUl:

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

 required:

 - appId

 SliceLoadLevelInformation:

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

 type: object

 properties:

 loadLevelInformation:

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

 snssais:

 type: array

 items:

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

 minItems: 1

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

 numOfUes:

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

 numOfPduSess:

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

 exceedLoadLevelThrInd:

 type: boolean

 confidence:

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

 required:

 - loadLevelInformation

 - snssais

 NsiLoadLevelInfo:

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

 type: object

 properties:

 loadLevelInformation:

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

 snssai:

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

 nsiId:

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

 resUsage:

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

 numOfExceedLoadLevelThr:

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

 exceedLoadLevelThrInd:

 type: boolean

 networkArea:

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

 timePeriod:

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

 numOfUes:

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

 numOfPduSess:

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

 confidence:

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

 required:

 - loadLevelInformation

 - snssai

 NsiIdInfo:

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

 type: object

 properties:

 snssai:

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

 nsiIds:

 type: array

 items:

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

 minItems: 1

 required:

 - snssai

 EventReportingRequirement:

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

 type: object

 properties:

 accuracy:

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

 accPerSubset:

 type: array

 items:

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

 minItems: 1

 description: >

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

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

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

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

 startTs:

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

 endTs:

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

 offsetPeriod:

 type: integer

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

 sampRatio:

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

 maxObjectNbr:

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

 maxSupiNbr:

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

 timeAnaNeeded:

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

 anaMeta:

 type: array

 items:

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

 minItems: 1

 anaMetaInd:

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

 TargetUeInformation:

 description: Identifies the target UE information.

 type: object

 properties:

 anyUe:

 type: boolean

 supis:

 type: array

 items:

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

 gpsis:

 type: array

 items:

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

 intGroupIds:

 type: array

 items:

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

 UeMobility:

 description: Represents UE mobility information.

 type: object

 properties:

 ts:

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

 recurringTime:

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

 duration:

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

 durationVariance:

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

 locInfos:

 type: array

 items:

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

 minItems: 1

 required:

 - duration

 - locInfos

 LocationInfo:

 description: Represents UE location information.

 type: object

 properties:

 loc:

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

 ratio:

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

 confidence:

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

 required:

 - loc

 UeCommunication:

 description: Represents UE communication information.

 type: object

 properties:

 commDur:

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

 commDurVariance:

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

 perioTime:

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

 perioTimeVariance:

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

 ts:

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

 tsVariance:

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

 recurringTime:

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

 trafChar:

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

 ratio:

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

 perioCommInd:

 type: boolean

 confidence:

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

 anaOfAppList:

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

 sessInactTimer:

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

 required:

 - commDur

 - trafChar

 TrafficCharacterization:

 description: Identifies the detailed traffic characterization.

 type: object

 properties:

 dnn:

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

 snssai:

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

 appId:

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

 fDescs:

 type: array

 items:

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

 minItems: 1

 maxItems: 2

 ulVol:

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

 ulVolVariance:

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

 dlVol:

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

 dlVolVariance:

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

 UserDataCongestionInfo:

 description: Represents the user data congestion information.

 type: object

 properties:

 networkArea:

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

 congestionInfo:

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

 snssai:

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

 CongestionInfo:

 description: Represents the congestion information.

 type: object

 properties:

 congType:

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

 timeIntev:

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

 nsi:

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

 confidence:

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

 topAppListUl:

 type: array

 items:

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

 minItems: 1

 topAppListDl:

 type: array

 items:

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

 minItems: 1

 required:

 - congType

 - timeIntev

 - nsi

 TopApplication:

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

 type: object

 properties:

 appId:

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

 ipTrafficFilter:

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

 ratio:

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

 QosSustainabilityInfo:

 description: Represents the QoS Sustainability information.

 type: object

 properties:

 areaInfo:

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

 startTs:

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

 endTs:

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

 qosFlowRetThd:

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

 ranUeThrouThd:

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

 snssai:

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

 confidence:

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

 QosRequirement:

 description: Represents the QoS requirements.

 type: object

 properties:

 5qi:

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

 gfbrUl:

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

 gfbrDl:

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

 resType:

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

 pdb:

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

 per:

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

 ThresholdLevel:

 description: Represents a threshold level.

 type: object

 properties:

 congLevel:

 type: integer

 nfLoadLevel:

 type: integer

 nfCpuUsage:

 type: integer

 nfMemoryUsage:

 type: integer

 nfStorageUsage:

 type: integer

 avgTrafficRate:

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

 maxTrafficRate:

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

 avgPacketDelay:

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

 maxPacketDelay:

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

 avgPacketLossRate:

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

 NfLoadLevelInformation:

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

 type: object

 properties:

 nfType:

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

 nfInstanceId:

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

 nfSetId:

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

 nfStatus:

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

 nfCpuUsage:

 type: integer

 nfMemoryUsage:

 type: integer

 nfStorageUsage:

 type: integer

 nfLoadLevelAverage:

 type: integer

 nfLoadLevelpeak:

 type: integer

 nfLoadAvgInAoi:

 type: integer

 snssai:

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

 confidence:

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

 required:

 - nfType

 - nfInstanceId

 NfStatus:

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

 type: object

 properties:

 statusRegistered:

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

 statusUnregistered:

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

 statusUndiscoverable:

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

 AnySlice:

 type: boolean

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

 LoadLevelInformation:

 type: integer

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

 AbnormalBehaviour:

 description: Represents the abnormal behaviour information.

 type: object

 properties:

 supis:

 type: array

 items:

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

 minItems: 1

 excep:

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

 dnn:

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

 snssai:

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

 ratio:

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

 confidence:

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

 addtMeasInfo:

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

 required:

 - excep

 Exception:

 description: Represents the Exception information.

 type: object

 properties:

 excepId:

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

 excepLevel:

 type: integer

 excepTrend:

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

 required:

 - excepId

 AdditionalMeasurement:

 description: Represents additional measurement information.

 type: object

 properties:

 unexpLoc:

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

 unexpFlowTeps:

 type: array

 items:

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

 minItems: 1

 unexpWakes:

 type: array

 items:

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

 minItems: 1

 ddosAttack:

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

 wrgDest:

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

 circums:

 type: array

 items:

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

 minItems: 1

 IpEthFlowDescription:

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

 type: object

 properties:

 ipTrafficFilter:

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

 ethTrafficFilter:

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

 AddressList:

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

 type: object

 properties:

 ipv4Addrs:

 type: array

 items:

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

 minItems: 1

 ipv6Addrs:

 type: array

 items:

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

 minItems: 1

 CircumstanceDescription:

 description: Contains the description of a circumstance.

 type: object

 properties:

 freq:

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

 tm:

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

 locArea:

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

 vol:

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

 RetainabilityThreshold:

 description: Represents a QoS flow retainability threshold.

 type: object

 properties:

 relFlowNum:

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

 relTimeUnit:

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

 relFlowRatio:

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

 NetworkPerfRequirement:

 description: Represents a network performance requirement.

 type: object

 properties:

 nwPerfType:

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

 relativeRatio:

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

 absoluteNum:

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

 required:

 - nwPerfType

 NetworkPerfInfo:

 description: Represents the network performance information.

 type: object

 properties:

 networkArea:

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

 nwPerfType:

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

 relativeRatio:

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

 absoluteNum:

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

 confidence:

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

 required:

 - networkArea

 - nwPerfType

 FailureEventInfo:

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

 type: object

 properties:

 event:

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

 failureCode:

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

 required:

 - event

 - failureCode

 AnalyticsMetadataIndication:

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

 type: object

 properties:

 dataWindow:

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

 dataStatProps:

 type: array

 items:

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

 minItems: 1

 strategy:

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

 aggrNwdafIds:

 type: array

 items:

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

 minItems: 1

 AnalyticsMetadataInfo:

 description: Contains analytics metadata information required for analytics aggregation.

 type: object

 properties:

 numSamples:

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

 dataWindow:

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

 dataStatProps:

 type: array

 items:

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

 minItems: 1

 strategy:

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

 accuracy:

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

 NumberAverage:

 description: Represents average and variance information.

 type: object

 properties:

 number:

 type: integer

 variance:

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

 required:

 - number

 - variance

 AnalyticsSubscriptionsTransfer:

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

 type: object

 properties:

 subsTransInfos:

 type: array

 items:

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

 minItems: 1

 required:

 - subsTransInfos

 SubscriptionTransferInfo:

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

 type: object

 properties:

 transReqType:

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

 nwdafEvSub:

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

 consumerId:

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

 contextId:

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

 sourceNfIds:

 type: array

 items:

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

 minItems: 1

 sourceSetIds:

 type: array

 items:

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

 minItems: 1

 modelInfo:

 type: array

 items:

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

 minItems: 1

 modelProvIds:

 type: array

 items:

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

 minItems: 1

 required:

 - transReqType

 - nwdafEvSub

 - consumerId

 ModelInfo:

 description: Contains information about an ML model.

 type: object

 properties:

 analyticsId:

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

 mlFileAddr:

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

 required:

 - analyticsId

 - mlFileAddr

 AnalyticsContextIdentifier:

 description: Contains information about available analytics contexts.

 type: object

 properties:

 subscriptionId:

 type: string

 description: The identifier of a subscription.

 nfAnaCtxts:

 type: array

 items:

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

 minItems: 1

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

 ueAnaCtxts:

 type: array

 items:

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

 minItems: 1

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

 allOf:

 - anyOf:

 - required: [nfAnaCtxts]

 - required: [ueAnaCtxts]

 - required: [subscriptionId]

 UeAnalyticsContextDescriptor:

 description: Contains information about available UE related analytics contexts.

 type: object

 properties:

 supi:

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

 anaTypes:

 type: array

 items:

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

 minItems: 1

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

 required:

 - supi

 - anaTypes

 DnPerfInfo:

 description: Represents DN performance information.

 type: object

 properties:

 appId:

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

 dnn:

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

 snssai:

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

 dnPerf:

 type: array

 items:

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

 minItems: 1

 confidence:

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

 required:

 - dnPerf

 DnPerf:

 description: Represents DN performance for the application.

 type: object

 properties:

 appServerInsAddr:

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

 upfId:

 type: string

 description: Identifies the UPF.

 dnai:

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

 perfData:

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

 spatialValidCon:

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

 temporalValidCon:

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

 PerfData:

 description: Represents DN performance data.

 type: object

 properties:

 avgTrafficRate:

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

 maxTrafficRate:

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

 avePacketDelay:

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

 maxPacketDelay:

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

 avgPacketLossRate:

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

 DispersionRequirement:

 description: Represents the dispersion analytics requirements.

 type: object

 properties:

 disperType:

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

 classCriters:

 type: array

 items:

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

 minItems: 1

 rankCriters:

 type: array

 items:

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

 minItems: 1

 dispOrderCriter:

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

 order:

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

 required:

 - disperType

 ClassCriterion:

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

 type: object

 properties:

 disperClass:

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

 classThreshold:

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

 thresMatch:

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

 required:

 - disperClass

 - classThreshold

 - thresMatch

 RankingCriterion:

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

 type: object

 properties:

 highBase:

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

 lowBase:

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

 required:

 - highBase

 - mediumBase

 DispersionInfo:

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

 type: object

 properties:

 tsStart:

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

 tsDuration:

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

 disperCollects:

 type: array

 items:

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

 minItems: 1

 disperType:

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

 required:

 - tsStart

 - tsDuration

 - disperCollects

 - disperType

 DispersionCollection:

 description: Dispersion collection per UE location or per slice.

 type: object

 properties:

 ueLoc:

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

 snssai:

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

 supis:

 type: array

 items:

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

 minItems: 1

 gpsis:

 type: array

 items:

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

 minItems: 1

 appVolumes:

 type: array

 items:

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

 minItems: 1

 disperAmount:

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

 disperClass:

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

 usageRank:

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

 minimum: 1

 maximum: 3

 percentileRank:

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

 ueRatio:

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

 confidence:

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

 oneOf:

 - required: [ueLoc]

 - required: [snssai]

 ApplicationVolume:

 description: Application data volume per Application Id.

 type: object

 properties:

 appId:

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

 appVolume:

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

 required:

 - appId

 - appVolume

 RedundantTransmissionExpReq:

 description: Represents other redundant transmission experience analytics requirements.

 type: object

 properties:

 redTOrderCriter:

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

 order:

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

 RedundantTransmissionExpInfo:

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

 type: object

 properties:

 spatialValidCon:

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

 dnn:

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

 redTransExps:

 type: array

 items:

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

 minItems: 1

 required:

 - redTransExps

 RedundantTransmissionExpPerTS:

 description: The redundant transmission experience per Time Slot.

 type: object

 properties:

 tsStart:

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

 tsDuration:

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

 redTransExp:

 type: string

 ueRatio:

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

 confidence:

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

 required:

 - tsStart

 - tsDuration

 - redTransExp

 WlanPerformanceReq:

 description: Represents other WLAN performance analytics requirements.

 type: object

 properties:

 ssIds:

 type: array

 items:

 type: string

 minItems: 1

 bssIds:

 type: array

 items:

 type: string

 minItems: 1

 wlanOrderCriter:

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

 order:

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

 WlanPerformanceInfo:

 description: The WLAN performance related information.

 type: object

 properties:

 networkArea:

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

 wlanPerSsidInfos:

 type: array

 items:

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

 minItems: 1

 required:

 - wlanPerSsidInfos

 WlanPerSsIdPerformanceInfo:

 description: The WLAN performance per SSID.

 type: object

 properties:

 ssId:

 type: string

 wlanPerTsInfos:

 type: array

 items:

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

 minItems: 1

 required:

 - ssId

 - wlanPerTsInfos

 WlanPerTsPerformanceInfo:

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

 type: object

 properties:

 tsStart:

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

 tsDuration:

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

 rssi:

 type: integer

 rtt:

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

 trafficInfo:

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

 numberOfUes:

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

 confidence:

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

 required:

 - tsStart

 - tsDuration

 anyOf:

 - required: [rssi]

 - required: [rtt]

 - required: [trafficInfo]

 - required: [numberOfUes]

 TrafficInformation:

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

 type: object

 properties:

 uplinkRate:

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

 downlinkRate:

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

 uplinkVolume:

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

 downlinkVolume:

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

 totalVolume:

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

 anyOf:

 - required: [uplinkRate]

 - required: [downlinkRate]

 - required: [uplinkVolume]

 - required: [downlinkVolume]

 - required: [totalVolume]

 AppListForUeComm:

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

 type: object

 properties:

 appId:

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

 startTime:

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

 appDur:

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

 occurRatio:

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

 spatialValidity:

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

 confidence:

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

 SessInactTimerForUeComm:

 description: Represents the N4 Session inactivity timer.

 type: object

 properties:

 N4SessId:

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

 sessInactiveTimer:

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

 confidence:

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

 DnPerformanceReq:

 description: Represents other DN performance analytics requirements.

 type: object

 properties:

 dnPerfOrderCriter:

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

 order:

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

 reportThresholds:

 type: array

 items:

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

 minItems: 1

#

# ENUMERATIONS DATA TYPES

#

 ResourceUsage:

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

 type: object

 properties:

 cpuUsage:

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

 memoryUsage:

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

 storageUsage:

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

 ConsumerNfInformation:

 description: Represents the analytics consumer NF Information.

 type: object

 properties:

 nfId:

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

 taiList:

 type: array

 items:

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

 minItems: 1

 anyOf:

 - required: [nfId]

 - required: [taiList]

 NotificationMethod:

 anyOf:

 - type: string

 enum:

 - PERIODIC

 - THRESHOLD

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

 NwdafEvent:

 anyOf:

 - type: string

 enum:

 - SLICE\_LOAD\_LEVEL

 - NETWORK\_PERFORMANCE

 - NF\_LOAD

 - SERVICE\_EXPERIENCE

 - UE\_MOBILITY

 - UE\_COMMUNICATION

 - QOS\_SUSTAINABILITY

 - ABNORMAL\_BEHAVIOUR

 - USER\_DATA\_CONGESTION

 - NSI\_LOAD\_LEVEL

 - DN\_PERFORMANCE

 - DISPERSION

 - RED\_TRANS\_EXP

 - WLAN\_PERFORMANCE

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

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

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

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

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

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

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

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

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

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

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

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

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

 Accuracy:

 anyOf:

 - type: string

 enum:

 - LOW

 - HIGH

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - LOW: Low accuracy.

 - HIGH: High accuracy.

 CongestionType:

 anyOf:

 - type: string

 enum:

 - USER\_PLANE

 - CONTROL\_PLANE

 - USER\_AND\_CONTROL\_PLANE

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

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

 ExceptionId:

 anyOf:

 - type: string

 enum:

 - UNEXPECTED\_UE\_LOCATION

 - UNEXPECTED\_LONG\_LIVE\_FLOW

 - UNEXPECTED\_LARGE\_RATE\_FLOW

 - UNEXPECTED\_WAKEUP

 - SUSPICION\_OF\_DDOS\_ATTACK

 - WRONG\_DESTINATION\_ADDRESS

 - TOO\_FREQUENT\_SERVICE\_ACCESS

 - UNEXPECTED\_RADIO\_LINK\_FAILURES

 - PING\_PONG\_ACROSS\_CELLS

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - UNEXPECTED\_UE\_LOCATION: Unexpected UE location

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

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

 - UNEXPECTED\_WAKEUP: Unexpected wakeup

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

 - WRONG\_DESTINATION\_ADDRESS: Wrong destination address

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

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

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

 ExceptionTrend:

 anyOf:

 - type: string

 enum:

 - UP

 - DOWN

 - UNKNOW

 - STABLE

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - UP: Up trend of the exception level.

 - DOWN: Down trend of the exception level.

 - UNKNOW: Unknown trend of the exception level.

 - STABLE: Stable trend of the exception level.

 TimeUnit:

 anyOf:

 - type: string

 enum:

 - MINUTE

 - HOUR

 - DAY

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - MINUTE: Time unit is per minute.

 - HOUR: Time unit is per hour.

 - DAY: Time unit is per day.

 NetworkPerfType:

 anyOf:

 - type: string

 enum:

 - GNB\_ACTIVE\_RATIO

 - GNB\_COMPUTING\_USAGE

 - GNB\_MEMORY\_USAGE

 - GNB\_DISK\_USAGE

 - NUM\_OF\_UE

 - SESS\_SUCC\_RATIO

 - HO\_SUCC\_RATIO

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

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

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

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

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

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

 ExpectedAnalyticsType:

 anyOf:

 - type: string

 enum:

 - MOBILITY

 - COMMUN

 - MOBILITY\_AND\_COMMUN

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

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

 MatchingDirection:

 anyOf:

 - type: string

 enum:

 - ASCENDING

 - DESCENDING

 - CROSSED

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - ASCENDING: Threshold is crossed in ascending direction.

 - DESCENDING: Threshold is crossed in descending direction.

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

 NwdafFailureCode:

 anyOf:

 - type: string

 enum:

 - UNAVAILABLE\_DATA

 - BOTH\_STAT\_PRED\_NOT\_ALLOWED

 - UNSATISFIED\_REQUESTED\_ANALYTICS\_TIME

 - OTHER

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

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

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

 AnalyticsMetadata:

 anyOf:

 - type: string

 enum:

 - NUM\_OF\_SAMPLES

 - DATA\_WINDOW

 - DATA\_STAT\_PROPS

 - STRATEGY

 - ACCURACY

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

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

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

 - ACCURACY: Level of accuracy reached for the analytics.

 DatasetStatisticalProperty:

 anyOf:

 - type: string

 enum:

 - UNIFORM\_DIST\_DATA

 - NO\_OUTLIERS

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

 OutputStrategy:

 anyOf:

 - type: string

 enum:

 - BINARY

 - GRADIENT

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

 TransferRequestType:

 anyOf:

 - type: string

 enum:

 - PREPARE

 - TRANSFER

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

 AnalyticsSubset:

 anyOf:

 - type: string

 enum:

 - NUM\_OF\_UE\_REG

 - NUM\_OF\_PDU\_SESS\_ESTBL

 - RES\_USAGE

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

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

 - EXCEED\_LOAD\_LEVEL\_THR\_IND

 - LIST\_OF\_TOP\_APP\_UL

 - LIST\_OF\_TOP\_APP\_DL

 - NF\_STATUS

 - NF\_RESOURCE\_USAGE

 - NF\_LOAD

 - NF\_PEAK\_LOAD

 - DISPER\_AMOUNT

 - DISPER\_CLASS

 - RANKING

 - PERCENTILE\_RANKING

 - RSSI

 - RTT

 - TRAFFIC\_INFO

 - NUMBER\_OF\_UES

 - APP\_LIST\_FOR\_UE\_COMM

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

 - AVG\_TRAFFIC\_RATE

 - MAX\_TRAFFIC\_RATE

 - AVG\_PACKET\_DELAY

 - MAX\_PACKET\_DELAY

 - AVG\_PACKET\_LOSS\_RATE

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

 DispersionType:

 oneOf:

 - type: string

 enum:

 - DVDA

 - TDA

 - DVDA\_AND\_TDA

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

 - DVDA: Data Volume Dispersion Analytics.

 - TDA: Transactions Dispersion Analytics.

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

 DispersionClass:

 oneOf:

 - type: string

 enum:

 - FIXED

 - CAMPER

 - TRAVELLER

 - TOP\_HEAVY

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

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

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

 DispersionOrderingCriterion:

 anyOf:

 - type: string

 enum:

 - TIME\_SLOT\_START

 - DISPERSION

 - CLASSIFICATION

 - RANKING

 - PERCENTILE\_RANKING

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

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

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

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

 RedTransExpOrderingCriterion:

 anyOf:

 - type: string

 enum:

 - TIME\_SLOT\_START

 - RED\_TRANS\_EXP

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

 WlanOrderingCriterion:

 anyOf:

 - type: string

 enum:

 - TIME\_SLOT\_START

 - NUMBER\_OF\_UES

 - RSSI

 - RTT

 - TRAFFIC\_INFO

 - type: string

 description: >

 This string provides forward-compatibility with future

 extensions to the enumeration but is not used to encode

 content defined in the present version of this API.

 description: >

 Possible values are

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

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

 - RSSI: Indicates the order of RSSI.

 - RTT: Indicates the order of RTT.

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

 ServiceExperienceType:

 anyOf:

 - type: string

 enum:

 - VOICE

 - VIDEO

 - type: string

 description: >

 This string provides forward-compatibility with future extensions to the enumeration but is not used to encode content defined in the present version of this API.

 description: >

 Possible values are

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

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

 DnPerfOrderingCriterion:

 anyOf:

 - type: string

 enum:

 - AVERAGE\_TRAFFIC\_RATE

 - MAXIMUM\_TRAFFIC\_RATE

 - AVERAGE\_PACKET\_DELAY

 - MAXIMUM\_PACKET\_DELAY

 - AVERAGE\_PACKET\_LOSS\_RATE

 - type: string

 description: >

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

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

 description: |

 Possible values are:

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

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

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

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

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

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

# A.5 Nnwdaf\_MLModelProvision API

openapi: 3.0.0

info:

 title: Nnwdaf\_MLModelProvision

 version: 1.0.0-alpha.2

 description: |

 Nnwdaf\_MLModelProvision API Service.

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externalDocs:

 description: 3GPP TS 29.520 V17.6.0; 5G System; Network Data Analytics Services.

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

servers:

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

 variables:

 apiRoot:

 default: https://example.com

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

security:

 - {}

 - oAuth2ClientCredentials:

 - nnwdaf-mlmodelprovision

paths:

 /subscriptions:

 post:

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

 operationId: CreateNWDAFMLModelProvisionSubcription

 tags:

 - Subscriptions (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

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

 content:

 application/json:

 schema:

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

 headers:

 Location:

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

 required: true

 schema:

 type: string

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 callbacks:

 myNotification:

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

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

 type: array

 items:

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

 minItems: 1

 responses:

 '204':

 description: No Content, Notification was succesfull

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 /subscriptions/{subscriptionId}:

 put:

 summary: update an existing Individual NWDAF ML Model Provision Subscription

 operationId: UpdateNWDAFMLModelProvisionSubcription

 tags:

 - Individual NWDAF ML Model Provision Subscription (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 parameters:

 - name: subscriptionId

 in: path

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

 required: true

 schema:

 type: string

 responses:

 '200':

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

 content:

 application/json:

 schema:

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

 '204':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '411':

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

 '413':

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

 '415':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

 delete:

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

 operationId: DeleteNWDAFMLModelProvisionSubcription

 tags:

 - Individual NWDAF ML Model Provision Subscription (Document)

 parameters:

 - name: subscriptionId

 in: path

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

 required: true

 schema:

 type: string

 responses:

 '204':

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

 '307':

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

 '308':

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

 '400':

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

 '401':

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

 '403':

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

 '404':

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

 '429':

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

 '500':

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

 '503':

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

 default:

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

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 nnwdaf-mlmodelprovision: Access to the Nnwdaf\_MLModelProvision API

 schemas:

 NwdafMLModelProvSubsc:

 description: Represents NWDAF Event Subscription resources.

 type: object

 properties:

 mLEventSubscs:

 type: array

 items:

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

 minItems: 1

 description: Subscribed events

 notifUri:

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

 mLEventNotifs:

 type: array

 items:

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

 minItems: 1

 suppFeats:

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

 notifCorreId:

 type: string

 eventReq:

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

 failEventReports:

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

 required:

 - mLEventSubscs

 - notifUri

 MLEventSubscription:

 description: Represents a subscription to a single event.

 type: object

 properties:

 mLEvent:

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

 mLEventFilter:

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

 tgtUe:

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

 mLTargetPeriod:

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

 expiryTime:

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

 required:

 - mLEvent

 - mLEventFilter

 NwdafMLModelProvNotif:

 description: Represents notifications on events that occurred.

 type: object

 properties:

 eventNotifs:

 type: array

 items:

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

 minItems: 1

 description: Notifications about Individual Events.

 subscriptionId:

 type: string

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

 required:

 - eventNotifs

 - subscriptionId

 MLEventNotif:

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

 type: object

 properties:

 event:

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

 notifCorreId:

 type: string

 mLFileAddr:

 type: string

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

 adrfId:

 type: string

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

 validityPeriod:

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

 spatialValidity:

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

 required:

 - event

 oneOf:

 - required: [mLFileAddr]

 - required: [adrfId]

 FailureEventInfoForMLModel:

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

 type: object

 properties:

 event:

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

 failureCode:

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

 required:

 - event

 - failureCode

#

# ENUMERATIONS DATA TYPES

#

 FailureCode:

 anyOf:

 - type: string

 enum:

 - UNAVAILABLE\_ML\_MODEL

 - type: string

 description: >

 This string provides forward-compatibility with future extensions to the enumeration but is not used to encode content defined in the present version of this API.

 description: >

 Possible values are

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

End of Changes \*\*\*