**3GPP TSG CT WG3 Meeting #137 *C3-245145r1***

**Hefei, CN, 14 - 18 October, 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **29.520** | **CR** | **0940** | **rev** | **1** | **Current version:** | **19.0.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Correction to anaMetaInd attribute | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNetAE19 | | | | |  | ***Date:*** | | | 2024-10-07 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | 23.288 6.1.3 Contents of Analytics Exposure  - Related to analytic consumers that aggregate analytics from multiple NWDAF subscriptions:  - [OPTIONAL] (Set of) NWDAF identifiers of NWDAF instances used by the NWDAF service consumer when aggregating multiple analytics subscriptions. See clause 6.1A.  23.288 6.1B.2.2 Analytics Subscription Transfer initiated by source NWDAF  NOTE 7: If this subscription is used as input for analytics aggregation by the analytics consumer, the analytics consumer might inform the other NWDAFs instance participating in this analytics aggregation that the Set of NWDAF identifiers of NWDAF instances used by the NWDAF service consumer for this analytics aggregation (see clause 6.1.3) has changed using the Nnwdaf\_AnalyticsSubscription\_Subscribe service operation.  23.288 7.2.2 Nnwdaf\_AnalyticsSubscription\_Subscribe service operation  **Inputs, Optional:**  - (Set of) NWDAF identifiers used by the NWDAF service consumer when aggregating multiple analytic subscriptions;  However, there are no NWDAF identifiers defined in Nnwdaf\_EventSubscription\_Subscribe request. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Extend NnwdafEventsSubscription data structure to include aggrNwdafIds attribute under feature control of AggrInfo. | | | | | | | | |
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| ***Consequences if not approved:*** | | Incorrect attribute descripiton. Missing applicable feature. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.3.2.2.2, 5.1.6.1, 5.1.6.2.7 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 does not have any impact in the OpenAPI specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* 1st 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 if the feature "EneNA" is supported;

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) values for the analytics metadata information in the "anaMetaInd" attribute if the feature "Aggregation" is supported;

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

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

NOTE 1: The NWDAF can use the use case context to select the most relevant ML model, when several ML models are available for the requested Analytics ID(s). The NWDAF containing AnLF can additionally provide the use case context when requesting an ML model from an NWDAF containing MTLF. The values of this parameter are not standardized.

For all the event types, the "event-filter" attribute may include:

- the analytics accuracy requirement information in "accuReq" attribute as indication to the NWDAF to activate checking the analytics accuracy information of the requested event, if the "AnalyticsAccuracy" feature is supported and the NF service consumer discovered or local configured the NWDAF containing an AnLF supporting the accuracy checking capability.

- use case context as "useCaseCxt" attribute, if the "ENAExt" feature is supported.

- information related to roaming within the "roamingInfo" attribute if the "RoamingAnalytics" feature is supported;

NOTE 2: The request for analytics accuracy information independently from request of the analytics event output is not supported in this release.

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;

- 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 3: 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;

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

a) list of NF instance types in the "nfTypes" attribute, if the "NsiLoadExt" feature is supported; and/or

b) identification of network area to which the request applies via identification of network area by "networkArea" attribute, if the "NsiLoadExt" 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 request applies by "supis" or "anyUe" attribute set to "true" in the "tgt-ue" 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.

- 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 "EneNA" feature is supported;

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

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

and may include:

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

b) if the feature "UeMobilityExt" is supported,

i) identification of LADN DNN in the "ladnDnns" attribute;

ii) visited Area(s) of Interest as the "visitedAreas" attirbute;

c) other UE mobility requirements in "ueMobilityReqs" attribute, if the "UeMobilityExt2\_eNA" feature is supported;

d) preferred granularity of location information as the "locGranularity" attribute if the feature "UeMobilityExt2\_eNA" is also supported;

e) identification of the preferred orientation of location information by " locOrientation" attribute if the feature "UeMobilityExt2\_eNA" is supported

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

g) the spatial granularity size of TA in the "spatialGranSizeTa" attribute if the "UeMobilityExt2\_eNA" feature is supported;

h) the spatial granularity size of cell in the "spatialGranSizeCell" attribute if the "UeMobilityExt2\_eNA" feature is supported;

i) the temporal granularity size in the "temporalGranSize" attribute if the "UeMobilityExt2\_eNA" feature is supported; and/or

j) the fine granularity areas as the "fineGranAreas" attribute if the feature "UeMobilityExt2\_eNA" is supported.

NOTE 6: 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 request applies by "supis" or "intGroupIds" attribute in the "tgt-ue" attribute;

and may include:

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 request 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;

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;

f) other UE communication requirements in "ueCommReqs" attribute, if the "UeCommunicationExt\_eNA" feature is supported; and/or

g) the spatial granularity size of TA in the "spatialGranSizeTa" attribute if the "UeCommunicationExt\_eNA" feature is supported.

h) the spatial granularity size of cell in the "spatialGranSizeCell" attribute if the "UeCommunicationExt\_eNA" 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 request applies by "supis", "intGroupIds" or "anyUe" attribute set to "true"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;

b) the network performance requirements via "nwPerfReqs" attribute, if the feature "NetworkPerformanceExt\_eNA" is supported;

the "event-filter" attribute may provide:

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

b) for each network performance type identified by "nwPerfTypes" attribute, the additional requirement by "addNwPerfReqs" attribute if the "NetworkPerformanceExt\_AIML" feature is supported; and/or

c) the spatial granularity size of TA in the "spatialGranSizeTa" attribute if the "DnPerfExt\_eNA" feature is supported;

d) the spatial granularity size of TA in the "spatialGranSizeCell" attribute if the "DnPerfExt\_eNA" feature is supported; and/or

e) the temporal granularity size of cell in the "temporalGranSize" attribute if the "DnPerfExt\_eNA" 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 request applies by "supis", "intGroupIds" or "anyUe" attribute set to "true" 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 7: 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 request 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 request 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) identication of all the RAT types and/or all the frequencies that the NWDAF received for the application or specific RAT type(s) and/or frequency(ies) by "ratFreqs" attribute if the feature "ServiceExperienceExt" is also supported;

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

h) the identification of the UPF as the "upfInfo" attribute if the feature "ServiceExperienceExt" is also supported;

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

j) combination of PDU Session parameters as the "pduSesInfos" attribute if the feature "ServiceExperienceExt2\_eNA" is also supported;

k) preferred granularity of location information as the "locGranularity" attribute if the feature "ServiceExperienceExt2\_eNA" is supported; and/or

l) the fine granularity areas as the "fineGranAreas" attribute if the feature "ServiceExperienceExt2\_eNA" 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 request 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 request applies by "anyUe" attribute set to "true" in the "tgt-ue" attribute;

the "event-filter" attribute may provide:

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

b) the spatial granularity size of TA in the "spatialGranSizeTa" attribute if the "QoSSustainExt\_eNA" feature is supported;

c) the spatial granularity size of cell in the "spatialGranSizeCell" attribute if the "QoSSustainExt\_eNA" feature is supported;

d) the temporal granularity size in the "temporalGranSize" attribute if the "QoSSustainExt\_eNA" feature is supported;

e) the fine granularity areas as the "fineGranAreas" attribute if the feature "QoSSustainExt\_eNA" is supported.

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

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

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

a) the user data congestion requirements via "userDataConReqs" attribute, if the feature "UserDataCongestionExt2\_eNA" is supported;

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 request applies via identification of network area by "networkArea" attribute (mandatory if "anyUe" attribute is set to true);

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;

e) the temporal granularity size in the "temporalGranSize" attribute if the "UserDataCongestionExt2\_eNA" 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;

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

- 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 set to "true" within "tgt-ue" attribute, "anyUe" attribute set to "true" is only supported in combination with "snssais" attribute, "networkArea" attribute and/or "disperClass" 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) 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;

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

6) preferred granularity of location information as the "locGranularity" attribute if the feature "DispersionExt\_eNA" is supported;

7) the spatial granularity size of TA in the "spatialGranSizeTa" attribute if the "DispersionExt\_eNA" feature is supported;

7) the spatial granularity size of cell in the "spatialGranSizeCell" attribute if the "DispersionExt\_eNA" feature is supported; and/or

8) the temporal granularity size in the "temporalGranSize" attribute if the "DispersionExt\_eNA" feature is supported.

- 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 set to "true" within "tgt-ue" attribute;

and may include:

1) identification of network area applies via identification of network area by "networkArea" attribute, if the "supis" attribute or "intGroupIds" attribute is included in the "tgt-ue" attribute;

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

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

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

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

6) the temporal granularity size in the "temporalGranSize" attribute if the "RedundantTransExpExt\_eNA" feature is supported.

- 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 set to "true" in the "tgt-ue" attribute. If "anyUe" attribute set to "true" 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 request 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;

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; and/or

4) the temporal granularity size in the "temporalGranSize" attribute if the "WlanPerfExt\_eNA" 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 request applies by "supis", "intGroupIds" or "anyUe" attribute set to "true" in the "tgt-ue" attribute;

and may include:

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

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

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

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

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

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

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

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

9) 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 applicable 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 and may include the attribute with value(s) only applicable to "DN\_PERFORMANCE" event and "DnPerformanceExt\_AIML" feature if supported.

11) the spatial granularity size of TA in the "spatialGranSizeTa" attribute if the "DnPerfExt\_eNA" feature is supported.

11) the spatial granularity size of cell in the "spatialGranSizeCell" attribute if the "DnPerfExt\_eNA" feature is supported.

12) the temporal granularity size in the "temporalGranSize" attribute if the "DnPerfExt\_eNA" feature is supported.

- if the feature "E2eDataVolTransTime" is supported and the event is "E2E\_DATA\_VOL\_TRANS\_TIME", shall provide:

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

and may include:

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

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

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

4) area of interest of the UEs by "networkArea" attribute; restricts the scope of the E2E data volume transfer time analytics to the provided area;

5) an optional list of analytics subsets by "listOfAnaSubsets" attribute with value(s) only applicable to "E2E\_DATA\_VOL\_TRANS\_TIME" event, if the "EneNA" feature is supported;

6) the QoS requirements via "qosRequ" attribute; and

7) E2E data volume transfer time requirements in the "dataVlTrnsTmRqs" attribute;

- if the feature "PduSesTraffic" is supported and the event is "PDU\_SESSION\_TRAFFIC", shall provide:

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

2) PDU Session traffic analytics requirements in "pduSesTrafReqs" attribute, which includes the known Application Identifier, IP Descriptions or Domain Descriptors.

3) DNN and/or S-NSSAI for the PDU Session(s) in the "dnns" and/or "snssais" attributes.

and may include:

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

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

NOTE 10: The predictions are not applicable for PDU Session traffic analytics.

- if the feature "MovementBehaviour" is supported and the event is "MOVEMENT\_BEHAVIOUR", shall provide:

1) identification of network area to which the request applies to restrict the scope of the movement behaviour analytics to the provided area by the "networkArea" attribute and/or the "fineGranAreas" attribute;

- and may include:

1) identification of the preferred orientation of location information by the "locOrientation" attribute;

2) Movement Behaviour analytics requirements in the "movBehavReqs" attribute, which includes preferred granularity of location information or preferred orientation of location information; and/or

3) an optional list of analytics subsets by the "listOfAnaSubsets" attribute with value(s) only applicable to the "MOVEMENT\_BEHAVIOUR" event, if the "EneNA" features is supported.

- if the feature "LocAccuracy" is supported and the event is "LOC\_ACCURACY", the "event-filter" attribute shall include:

1) either a network area to which the request applies within the "networkArea" attribute or an exact location to which the request applies within the "location" attribute;

- and the "event-filter" attribute may include:

1) Location accuracy analytics requirements within the "locAccReqs" attribute; and/or

2) an optional list of analytics subsets within the "listOfAnaSubsets" attribute with value(s) only applicable to the "LOC\_ACCURACY" event, if the "EneNA" features is supported.

NOTE 11: Location accuracy analytics do not have a target UE, they are always for any UE.

- if the feature "RelativeProximity" is supported and the event is " RELATIVE\_PROXIMITY", shall provide:

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

- and may include in the "event-filter" attribute:

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

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

3) identification of network area to which the request applies via identification of network area by "networkArea" attribute;

4) Relative Proximity analytics requirements in "relProxReqs" attribute; and/or

5) an optional list of analytics subsets by "listOfAnaSubsets" attribute with value(s) only applicable to "RELATIVE\_PROXIMITY" event prediction, if the "EneNA" features 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 clause 4.2.2.4.2.

- the analytics accuracy information in the "accuInfo" attribute, if the feature "AnalyticsAccuracy" is supported and the analytics accuracy requirement was requested in the "accuReq" attribute.

NOTE 12: In this version of the specification, NWDAF containing AnLF can provide accuracy information to an NF consumer that requests both the analytics and the accuracy information.

NOTE 13: When receiving a request from an NF consumer that includes a request for accuracy information, the analytics and the accuracy information can be provided by NWDAF containing AnLF within the single response.

If the requested 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 ProblemDetailsAnalyticsInfoRequestdata 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.

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

When the "PredictionError" feature is supported, if the analytics target period provided in the body of the HTTP GET request includes the prediction time period in the future and the event is "SM\_CONGESTION" and/or "PDU\_SESSION\_TRAFFIC", the NWDAF shall reject the request with an HTTP "400 Bad Request" response including the "cause" attribute set to "PREDICTION\_NOT\_ALLOWED".

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

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

NOTE 13: When the target of reporting is a SUPI or a GPSI then the subscription can be rejected, e.g. because user consent is not granted, and the error is sent to the consumer. When the target of reporting is an Internal Group Id, or a list of SUPIs/GPSI(s) or any UE, and the user consent is not granted for a subset of the impacted users, then no error is sent, but a subset of the SUPIs/GPSIs is skipped if user consent is not granted.

If the RoamingAnalytics feature is supported and the NWDAF determines based on operator configuration and the requested analytics that analytics or input data from the VPLMN are required, and the NWDAF does not support roaming exchange and it cannot forward the request to another NWDAF, then the NWDAF shall reject the request with an HTTP "403 Forbidden" response including the "cause" attribute set to "NO\_ROAMING\_SUPPORT".

If an error occurs when processing the HTTP GET request, the NWDAF shall send an HTTP error response as specified in clause 5.2.7.

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

#### 5.1.6.1 General

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

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

Table 5.1.6.1-1: Nnwdaf\_EventsSubscription specific Data Types

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Data type | | Section defined | | Description | | Applicability | |
| AbnormalBehaviour | | 5.1.6.2.15 | | Represents the abnormal behaviour information. | | AbnormalBehaviour | |
| Accuracy | | 5.1.6.3.5 | | Represents the preferred level of accuracy of the analytics. | |  | |
| AccuracyInfo | | 5.1.6.2.89 | | The analytics accuracy information. | | AnalyticsAccuracy | |
| AccuracyReq | | 5.1.6.3.88 | | Represents the analytics accuracy requirement information. | | AnalyticsAccuracy | |
| AdditionalMeasurement | | 5.1.6.2.26 | | Represents additional measurement information. | | AbnormalBehaviour | |
| AddressList | | 5.1.6.2.28 | | Represents a list of IPv4 and/or IPv6 addresses. | | AbnormalBehaviour | |
| AnalyticsContextIdentifier | | 5.1.6.2.43 | | Contains information about available analytics contexts. | | AnaSubTransfer | |
| AnalyticsAccuracyIndication | | 5.1.6.3.37 | | Represents the analytics accuracy indication. | | AnalyticsAccuracy | |
| AnalyticsFeedbackInfo | | 5.1.6.2.105 | | Contains analytics feedback information. | | AnalyticsAccuracy | |
| AnalyticsMetadata | | 5.1.6.3.14 | | Represents the types of analytics metadata information that can be requested. | | Aggregation | |
| AnalyticsMetadataIndication | | 5.1.6.2.36 | | Contains values for analytics metadata information. | | Aggregation | |
| AnalyticsMetadataInfo | | 5.1.6.2.37 | | Contains analytics metadata information required for analytics aggregation. | | Aggregation | |
| AnalyticsSubscriptionsTransfer | | 5.1.6.2.40 | | Contains information about a request to transfer analytics subscriptions. | | AnaSubTransfer | |
| AnalyticsSubset | | 5.1.6.3.18 | | Analytics subset used to indicate the content of the analytics. | | EneNA | |
| AnySlice | | 5.1.6.3.2 | | Represents the any slices. | |  | |
| ApplicationVolume | | 5.1.6.2.55 | | Application data volume per application Id. | | Dispersion | |
| AppListForUeComm | | 5.1.6.2.64 | | Represents the analytics of the application list used by UE. | | UeCommunicationExt | |
| BwRequirement | | 5.1.6.2.25 | | Represents bandwidth requirement. | | ServiceExperience | |
| ClassCriterion | | 5.1.6.2.51 | | Disperion class criterion. | | Dispersion | |
| CircumstanceDescription | | 5.1.6.2.29 | | Contains the description of a circumstance. | | AbnormalBehaviour | |
| CongestionInfo | | 5.1.6.2.18 | | Represents the congestion information | | UserDataCongestion | |
| CongestionType | | 5.1.6.3.8 | | Identification congestion analytics type. | | UserDataCongestion | |
| ConsumerNfInformation | | 5.1.6.2.49 | | Represents the analytics consumer NF Information. | | AnaSubTransfer | |
| DatasetStatisticalProperty | | 5.1.6.3.15 | | Dataset statistical properties of the data used to generate the analytics. | | Aggregation | |
| DataVolume | | 5.1.6.2.85 | | Indicates a specific data volume transmitted once from UE to AF and/or from AF to UE | | E2eDataVolTransTime | |
| DataVolumeTransferTime | | 5.1.6.2.90 | | Indicates the E2E data volume transfer time and the data volume used to derive the transfer time. | | E2eDataVolTransTime | |
| DeviceType | | 5.1.6.3.31 | | The type of device. | | QoSSustainabilityExt\_eNA | |
| Direction | | 5.1.6.3.39 | | Heading directions of the UE flow in the target area. | | MovementBehaviour | |
| DirectionInfo | | 5.1.6.2.75 | | Represents the UE direction information. | | UeMobilityExt2\_eNA  MovementBehaviour | |
| DispersionClass | | 5.1.6.3.20 | | Dispersion class. | | Dispersion | |
| DispersionCollection | | 5.1.6.2.54 | | Dispersion collections per UE location or or per slice. | | Dispersion | |
| DispersionInfo | | 5.1.6.2.53 | | Dispersion analytics information. | | Dispersion | |
| DispersionRequirement | | 5.1.6.2.50 | | Dispersion analytics requirement. | | Dispersion | |
| DispersionType | | 5.1.6.3.19 | | Dispersion type. | | Dispersion | |
| DispersionOrderingCriterion | | 5.1.6.3.21 | | Ordering criterion for the list of Dispersion. | | Dispersion | |
| DnPerf | | 5.1.6.2.46 | | Represents DN performance information. | | DnPerformance | |
| DnPerfInfo | | 5.1.6.2.45 | | Represents DN performances for the application. | | DnPerformance | |
| DnPerfOrderingCriterion | | 5.1.6.3.25 | | Ordering criterion for the list of DN performance analytics. | | DnPerformance | |
| DnPerformanceReq | | 5.1.6.2.66 | | Represents DN performance analytics requirement. | | DnPerformance | |
| E2eDataVolTransTimeCriterion | | 5.1.6.3.35 | | Ordering criterion for the list of E2E data volume transfer time. | | E2eDataVolTransTime | |
| E2eDataVolTransTimeInfo | | 5.1.6.2.83 | | Represents the E2E data volume transfer time Information. | | E2eDataVolTransTime | |
| E2eDataVolTransTimeReq | | 5.1.6.2.82 | | Represents the E2E data volume transfer time requirement. | | E2eDataVolTransTime | |
| E2eDataVolTransTimePerTS | | 5.1.6.2.84 | | Represents the E2E data volume transfer time requirement per Time slot. | | E2eDataVolTransTime | |
| E2eDataVolTransTimePerUe | | 5.1.6.2.86 | | Represents the E2E data volume transfer time per UE. | | E2eDataVolTransTime | |
| E2eDataVolTransTimeUeList | | 5.1.6.2.87 | | Represents the E2E data volume transfer time per UE list. | | E2eDataVolTransTime | |
| EventNotification | | 5.1.6.2.5 | | Describes Notifications about events that occurred. | |  | |
| EventReportingRequirement | | 5.1.6.2.7 | | Represents the type of reporting the subscription requires. | |  | |
| EventSubscription | | 5.1.6.2.3 | | Represents the subscription to a single event. | |  | |
| Exception | | 5.1.6.2.16 | | Describes the Exception information. | | AbnormalBehaviour | |
| ExceptionId | | 5.1.6.3.6 | | Describes the Exception Id. | | AbnormalBehaviour | |
| ExceptionTrend | | 5.1.6.3.7 | | Describes the Exception Trend. | | AbnormalBehaviour | |
| ExpectedAnalyticsType | | 5.1.6.3.11 | | Represents expected UE analytics type. | | AbnormalBehaviour | |
| FailureEventInfo | | 5.1.6.2.35 | | Contains information on the event for which the subscription is not successful. | |  | |
| GeoDistributionInfo | | 5.1.6.2.76 | | Represents the geographical distribution of the UEs. | | UeMobilityExt\_AIML  E2eDataVolTransTime | |
| GeoLocation | | 5.1.6.2.95 | | Represents a geographic location, using either standard or local coordinates and optionally including the altitude. | | LocAccuracy | |
| IpEthFlowDescription | | 5.1.6.2.27 | | Contains the description of an Uplink and/or Downlink Ethernet flow. | | AbnormalBehaviour | |
| LoadLevelInformation | | 5.1.6.3.2 | | Represents load level information of the network slice and the optionally associated network slice instance. | |  | |
| LocAccuracyInfo | | 5.1.6.2.97 | | Contains Location Accuracy information. | | LocAccuracy | |
| LocAccuracyPerMethod | | 5.1.6.2.98 | | Contains Location Accuracy information per Positioning Method. | | LocAccuracy | |
| LocAccuracyReq | | 5.1.6.2.96 | | Contains Location Accuracy analytics requirements. | | LocAccuracy | |
| LocationInfo | | 5.1.6.2.11 | | Represents UE location information. | | UeMobility | |
| LocInfoGranularity | | 5.1.6.3.32 | | Represents the preferred granularity of location information. | | ServiceExperienceExt2\_eNA  UeMobilityExt2\_eNA  DispersionExt\_eNA  MovementBehaviour | |
| LocationOrientation | | 5.1.6.3.38 | | Represents preferred orientation of location information. | | MovementBehaviour | |
| MatchingDirection | | 5.1.6.3.12 | | Defines the matching direction when crossing a threshold. | | NfLoad, QoSSustainability, UserDataCongestion, NetworkPerformance  Dispersion  RedundantTransmissionExp  WlanPerformance  ServiceExperienceExt  NsiLoadExt  LocAccuracy  E2eDataVolTransTime | |
| MLModelInfo | | 5.1.6.2.69 | | The information of the ML model. | | AnaSubTransfer | |
| ModelInfo | | 5.1.6.2.42 | | Contains information about an ML model. | | AnaSubTransfer | |
| MovBehav | | 5.1.6.2.93 | | Represents the Movement Behaviour information per time slot. | | MovementBehaviour | |
| MovBehavInfo | | 5.1.6.2.92 | | Represents the Movement Behaviour information. | | MovementBehaviour | |
| MovBehavReq | | 5.1.6.2.91 | | Represents the Movement Behaviour analytics requirements. | | MovementBehaviour | |
| NetworkPerfInfo | | 5.1.6.2.23 | | Represents the network performance information. | | NetworkPerformance | |
| NetworkPerfOrderCriterion | | 5.1.6.3.30 | | The ordering criterion for the list of network performance analytics. | | NetworkPerformanceExt\_eNA | |
| NetworkPerfRequirement | | 5.1.6.2.22 | | Represents a network performance requirement. | | NetworkPerformance | |
| NetworkPerfType | | 5.1.6.3.10 | | Represents the network performance types. | | NetworkPerformance | |
| NfLoadLevelInformation | | 5.1.6.2.31 | | Represents load level information of a given NF instance. | | NfLoad | |
| NfStatus | | 5.1.6.2.32 | | Provides the percentage of time spent on various NF states. | | NfLoad | |
| NnwdafEventsSubscription | | 5.1.6.2.2 | | Represents an Individual NWDAF Event Subscription resource. | |  | |
| NnwdafEventsSubscriptionNotification | | 5.1.6.2.4 | | Represents an Individual NWDAF Event Subscription Notification resource. | |  | |
| NumberAverage | | 5.1.6.2.38 | | Represents average and variance information. | | NsiLoadExt | |
| NwdafEvent | | 5.1.6.3.4 | | Describes the NWDAF Events. | |  | |
| NwdafFailureCode | | 5.1.6.3.13 | | Identifies the failure reason. | |  | |
| NotificationMethod | | 5.1.6.3.3 | | Represents the notification methods that can be subscribed. | |  | |
| NsiIdInfo | | 5.1.6.2.33 | | Represents the S-NSSAI and the optionally associated Network Slice Instance Identifier(s). | | ServiceExperience  NsiLoad  DnPerformance | |
| NsiLoadLevelInfo | | 5.1.6.2.34 | | Represents the load level information for an S-NSSAI and the optionally associated network slice instance. | | NsiLoad | |
| ObservedRedundantTransExp | | 5.1.6.2.70 | | Represents the observed Redundant Transmission Experience. | | RedundantTransmissionExp | |
| OutputStrategy | | 5.1.6.3.16 | | Represents the output strategy used for the reporting of the analytics. | | Aggregation | |
| PerfData | | 5.1.6.2.47 | | Represents DN performance information. | | DnPerformance | |
| PfdDeterminationInfo | | 5.1.6.2.73 | | Represents the PFD Determination information. | | PfdDetermination | |
| PrevSubInfo | | 5.1.6.2.68 | | Information of the previous subscription. | | AnaCtxTransfer | |
| QosRequirement | | 5.1.6.2.20 | | Represents the QoS requirements. | | QoSSustainability  E2eDataVolTransTime | |
| QosSustainabilityInfo | | 5.1.6.2.19 | | Represents the QoS Sustainability information. | | QoSSustainability | |
| RankingCriterion | | 5.1.6.2.52 | | Ranking criterion. | | Dispersion | |
| RatFreqInformation | | 5.1.6.2.67 | | Represents the RAT type and/or Frequency information. | | ServiceExperienceExt | |
| RedTransExpOrderingCriterion | | 5.1.6.3.22 | | Ordering criterion for the list of Redundant Transmission Experience. | | RedundantTransmissionExp | |
| RedundantTransmissionExpInfo | | 5.1.6.2.57 | | Redundant transmission experience analytics information. | | RedundantTransmissionExp | |
| RedundantTransmissionExpPerTS | | 5.1.6.2.58 | | Redundant Transmission Experience per Time Slot. | | RedundantTransmissionExp | |
| RedundantTransmissionExpReq | | 5.1.6.2.56 | | Redundant transmission experience analytics requirement. | | RedundantTransmissionExp | |
| RelProxInfo | | 5.1.6.2.100 | | Relative Proximity analytics information. | | RelativeProximity | |
| RelProxReq | | 5.1.6.2.99 | | Relative Proximity analytics requirements. | | RelativeProximity | |
| ResourceUsage | | 5.1.6.2.48 | | The current usage of the virtual resources assigned to the NF instances belonging to a particular network slice instance. | | NsiLoadExt | |
| ResourceUsageRequirement | | 5.1.6.2.81 | | Indicates more requirements when providing resource usage information for network performance. | | NetworkPerformanceExt\_AIML | |
| RetainabilityThreshold | | 5.1.6.2.21 | | Represents a QoS flow retainability threshold. | | QoSSustainability | |
| RoamingInfo | | 5.1.6.2.106 | | Contains information related to roaming analytics. | | RoamingAnalytics | |
| PduSessionInfo | | 5.1.6.2.74 | | Represents combination of PDU Session parameters. | | ServiceExperienceExt2\_eNA | |
| ServiceExperienceInfo | | 5.1.6.2.24 | | Represents the service experience information. | | ServiceExperience | |
| ServiceExperienceType | | 5.1.6.3.24 | | Represents the type of Service Experience Analytics. | | ServiceExperienceExt | |
| SessInactTimerForUeComm | | 5.1.6.2.65 | | Represents the N4 Session inactivity timer. | | UeCommunicationExt | |
| SliceLoadLevelInformation | | 5.1.6.2.6 | | Represents the slices and their load level information. | |  | |
| SpeedThresholdInfo | | 5.1.6.2.94 | | UEs information whose speed is faster than the speed threshold. | | MovementBehaviour | |
| SubscriptionTransferInfo | | 5.1.6.2.41 | | Contains information about subscriptions that are requested to be transferred. | | AnaSubTransfer | |
| SuggestedPfdInfo | | 5.1.6.2.107 | | Represents the suggested PFD information for the application identifier. | | PfdDetermination | |
| TargetUeInformation | | 5.1.6.2.8 | | Identifies the target UE information. | | ServiceExperience  NfLoad  NetworkPerformance  UserDataCongestion  UeMobility  UeCommunication  AbnormalBehaviour  QoSSustainability  Dispersion  RedundantTransmissionExp  WlanPerformance  DnPerformance  PduSesTraffic  E2eDataVolTransTime | |
| TdTraffic | | 5.1.6.2.78 | | Represents traffic that matches or unmatches Traffic Descriptor over the established PDU Session(s). | | PduSesTraffic | |
| TermCause | | 5.1.6.3.26 | | Represents a cause for requesting to terminate an analytics subscription. | | TermRequest | |
| ThresholdLevel | | 5.1.6.2.30 | | Describes a threshold level. | | UserDataCongestion  NfLoad  DnPerformance  ServiceExperienceExt  MovementBehaviour | |
| TimestampedLocation | | 5.1.6.2.103 | | The timestamped locations of the trajectory of the UE. | | RelativeProximity | |
| TimeToCollisionInfo | | 5.1.6.2.104 | | Time To Collision (TTC) information. | | RelativeProximity | |
| TimeUnit | | 5.1.6.3.9 | | Represents the unit for the session active time. | | QoSSustainability | |
| TopApplication | | 5.1.6.2.39 | | Top application that contributes the most to the traffic. | | UserDataCongestionExt | |
| TrafficCharacterization | | 5.1.6.2.14 | | Identifies the detailed traffic characterization. | | UeCommunication | |
| TrafficDirection | | 5.1.6.3.33 | | The traffic direction for the resource usage information. | | NetworkPerformanceExt\_AIML | |
| TrafficInformation | | 5.1.6.2.63 | | Traffic information including UL/DL data rate and/or Traffic volume. | | WlanPerformance | |
| TransferRequestType | | 5.1.6.3.17 | | Represents the type of a request for analytics subscription transfer. | | AnaSubTransfer | |
| UeAnalyticsContextDescriptor | | 5.1.6.2.44 | | Contains information about available UE related analytics contexts. | | AnaSubTransfer | |
| UeCommunication | | 5.1.6.2.13 | | Represents UE communication information. | | UeCommunication | |
| UeCommOrderCriterion | | 5.1.6.3.29 | | The ordering criterion for the list of UE communication analytics. | | UeCommunicationExt\_eNA | |
| UeCommReq | | 5.1.6.2.72 | | UE communication analytics requirement. | | UeCommunicationExt\_eNA | |
| UeMobilityOrderCriterion | | 5.1.6.3.28 | | The ordering criterion for the list of UE mobility analytics. | | UeMobilityExt2\_eNA | |
| UeMobilityReq | | 5.1.6.2.71 | | UE mobility analytics requirement. | | UeMobilityExt2\_eNA | |
| UeMobility | | 5.1.6.2.10 | | Represents UE mobility information. | | UeMobility | |
| UeProximity | | 5.1.6.2.101 | | Observed or Predicted proximity information. | | RelativeProximity | |
| UeTrajectory | | 5.1.6.2.102 | | Relative timestamped UE positions. | | RelativeProximity | |
| PduSesTrafficInfo | | 5.1.6.2.77 | | Represents PDU Session traffic analytics information. | | PduSesTraffic | |
| PduSesTrafficReq | | 5.1.6.2.79 | | Represents PDU Session traffic analytics requirement. | | PduSesTraffic | |
| UserDataConOrderCrit | | 5.1.6.3.27 | | The ordering criterion for the list of User Data Congestion analytics. | | UserDataCongestionExt2\_eNA | |
| UserDataCongestionInfo | | 5.1.6.2.17 | | Represents the user data congestion information. | | UserDataCongestion | |
| ValueExpression | | 5.1.6.3.34 | | Indicates average or peak value of the resource usage for the network performance type | | NetworkPerformanceExt\_AIML | |
| WlanOrderingCriterion | | 5.1.6.3.23 | | Ordering criterion for the list of WLAN performance information. | | WlanPerformance | |
| WlanPerformanceReq | | 5.1.6.2.59 | | WLAN performance analytics requirement. | | WlanPerformance | |
| WlanPerformanceInfo | | 5.1.6.2.60 | | WLAN performance analytics information. | | WlanPerformance | |
| WlanPerSsIdPerformanceInfo | | 5.1.6.2.61 | | WLAN performance information per SSID of WLAN access points deployed in the Area of Interest. | | WlanPerformance | |
| WlanPerTsPerformanceInfo | | 5.1.6.2.62 | | WLAN performance information per Time Slot during the analytics target period. | | WlanPerformance | |
| WlanPerUeIdPerformanceInfo | | 5.1.6.2.80 | | WLAN performance information per UE ID of WLAN access points deployed in the Area of Interest. | | WlanPerformanceExt\_AIML | |

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

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

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Reference | Comments | Applicability |
| 5Qi | 3GPP TS 29.571 [8] | Identifies the 5G QoS identifier | QoSSustainability  E2eDataVolTransTime |
| AccessType | 3GPP TS 29.571 [8] | Identifies the access type. | ServiceExperienceExt2\_eNA  E2eDataVolTransTime |
| AddrFqdn | 3GPP TS 29.517 [22] | Represents the IP address or FQDN of the Application Server. | DnPerformance  ServiceExperienceExt |
| ApplicationId | 3GPP TS 29.571 [8] | Identifies the application identifier. | ServiceExperience  UeCommunication  AbnormalBehaviour  Dispersion  DnPerformance  PduSesTraffic  E2eDataVolTransTime |
| ArfcnValueNR | 3GPP TS 29.571 [8] | Integer value indicating the ARFCN applicable for a downlink, uplink or bi-directional (TDD) NR global frequency raster.  Minimum = 0. Maximum = 3279165. | ServiceExperienceExt |
| BitRate | 3GPP TS 29.571 [8] | String representing a bit rate that shall be formatted as follows:  pattern: "^\d+(\.\d+)? (bps|Kbps|Mbps|Gbps|Tbps)$"  Examples:  "125 Mbps", "0.125 Gbps", "125000 Kbps". | ServiceExperience  QoSSustainability  WlanPerformance  DnPerformance  E2eDataVolTransTime |
| DateTime | 3GPP TS 29.571 [8] | Identifies the time. |  |
| Dnai | 3GPP TS 29.571 [8] | Identifies a user plane access to one or more DN(s). | ServiceExperience  DnPerformance |
| Dnn | 3GPP TS 29.571 [8] | Identifies the DNN. | ServiceExperience  AbnormalBehaviour  UeCommunication  DnPerformance  SMCCE  PduSesTraffic  E2eDataVolTransTime |
| DomainNameProtocol | 3GPP TS 29.122 [19] | Indicates the additional protocol and protocol field for domain names to be matched. | PfdDetermination |
| DurationSec | 3GPP TS 29.571 [8] |  |  |
| EthFlowDescription | 3GPP TS 29.514 [21] |  | UeCommunication  AbnormalBehaviour |
| ExpectedUeBehaviourData | 3GPP TS 29.503 [23] |  | AbnormalBehaviour |
| Float | 3GPP TS 29.571 [8] |  |  |
| FlowDescription | 3GPP TS 29.514 [21] |  | UeCommunication  AbnormalBehaviour  PduSesTraffic |
| FlowInfo | 3GPP TS 29.122 [19] |  | UserDataCongestionExt |
| GeographicalArea | 3GPP TS 29.522 [32] | Identifies the geographical location (longitude and latitude level). | UeMobilityExt2\_eNA  ServiceExperienceExt2\_eNA  QoSSustainabilityExt\_eNA  MovementBehaviour |
| GeographicalCoordinates | 3GPP TS 29.572 [30] | Represents the geographical coordinates. | MovementBehaviour |
| Gpsi | 3GPP TS 29.571 [8] | The GPSI for an UE. | UserDataCongestionExt  UeMobilityExt\_AIML  E2eDataVolTransTime |
| GroupId | 3GPP TS 29.571 [8] | Identifies a group of UEs. | UeMobility  UeCommunication NetworkPerformance  AbnormalBehaviour  ServiceExperience  Dispersion  RedundantTransmissionExp  WlanPerformance  PduSesTraffic |
| Ipv4Addr | 3GPP TS 29.571 [8] |  |  |
| Ipv6Addr | 3GPP TS 29.571 [8] |  |  |
| LocalOrigin | 3GPP TS 29.572 [30] | Represents a reference point for modelling locations in relation to it. | LocAccuracy |
| NetworkAreaInfo | 3GPP TS 29.554 [18] | Identifies the network area. | ServiceExperience  QoSSustainability  AbnormalBehaviour  UeMobility  UserDataCongestion  NetworkPerformance  NsiLoadExt  NfLoadExt  Dispersion  RedundantTransmissionExp  WlanPerformance  UeCommunication  DnPerformance  PduSesTraffic  E2eDataVolTransTime  MovementBehaviour |
| NfInstanceId | 3GPP TS 29.571 [8] | Identifies an NF instance. | NfLoad  Aggregation |
| NfSetId | 3GPP TS 29.571 [8] | Identifies an NF Set instance. | NfLoad |
| NFType | 3GPP TS 29.510 [12] | Indentifies a type of NF. | NfLoad |
| NsiId | 3GPP TS 29.531 [24] | Identifies a Network Slice Instance. | ServiceExperience  NsiLoad  DnPerformance |
| PacketDelBudget | 3GPP TS 29.571 [8] |  | QoSSustainability  DnPerformance  RedundantTransExpExt\_eNA |
| PacketErrRate | 3GPP TS 29.571 [8] |  | QoSSustainability |
| PacketLossRate | 3GPP TS 29.517 [22] | Indicates Packet Loss Rate. | DnPerformance  RedundantTransExpExt\_eNA |
| PduSessionId | 3GPP TS 29.571 [8] | Identifies PDU Session |  |
| PduSessionType | 3GPP TS 29.571 [8] | Identifies the PDU Session Type. | ServiceExperienceExt2\_eNA |
| PlmnIdNid | 3GPP TS 29.571 [8] | PLMN identifier. | RoamingAnalytics |
| Point | 3GPP TS 29.572 [30] | Represents a location in geographical co-ordinates. | LocAccuracy |
| PointAltitude | 3GPP TS 29.572 [30] | Represents a location including an altitude in geographical co-ordinates. | LocAccuracy |
| PositioningMethod | 3GPP TS 29.572 [30] | Represents a positioning method. | LocAccuracy |
| ProblemDetails | 3GPP TS 29.571 [8] | Used in error responses to provide more detailed information about an error. |  |
| QosResourceType | 3GPP TS 29.571 [8] | Identifies the resource type in QoS characteristics. | QoSSustainability |
| RatType | 3GPP TS 29.571 [8] | Identifies the RAT type. | ServiceExperienceExt  E2eDataVolTransTime |
| RedirectResponse | 3GPP TS 29.571 [8] | Contains redirection related information. | ES3XX |
| RelativeCartesianLocation | 3GPP TS 29.572 [30] | Represents distances from a reference point. | LocAccuracy |
| ReportingInformation | 3GPP TS 29.523 [20] | Represents the type of reporting the subscription requires. |  |
| SamplingRatio | 3GPP TS 29.571 [8] |  |  |
| ScheduledCommunicationTime | 3GPP TS 29.122 [19] |  | UeMobility UeCommunication |
| SmcceInfo | 5.2.6.2.12 | Represents the analytics of Session Management Congestion Control Experience information. | SMCCE |
| Snssai | 3GPP TS 29.571 [8] | Identifies the S-NSSAI (Single Network Slice Selection Assistance Information). |  |
| SscMode | 3GPP TS 29.571 [8] | Identifies te SSC Mode of the PDU Session. | ServiceExperienceExt2\_eNA |
| Supi | 3GPP TS 29.571 [8] | The SUPI for an UE. | ServiceExperience,  NfLoad  NetworkPerformance,  UserDataCongestion  UeMobility  UeCommunication  AbnormalBehaviour  Dispersion  RedundantTransmissionExp  WlanPerformance  PduSesTraffic |
| SupportedFeatures | 3GPP TS 29.571 [8] | Used to negotiate the applicability of the optional features defined in table 5.1.8-1. |  |
| SvcExperience | 3GPP TS 29.517 [22] |  | ServiceExperience |
| Tai | 3GPP TS 29.571 [8] | Tracking Area Information. | AnaSubTransfer |
| TimeWindow | 3GPP TS 29.122 [19] |  |  |
| Uinteger | 3GPP TS 29.571 [8] | Unsigned Integer, i.e. only value 0 and integers above 0 are permissible. |  |
| UpfInformation | 3GPP TS 29.508 [29] | The information of the UPF serving the UE. | ServiceExperienceExt  DnPerformance |
| Uri | 3GPP TS 29.571 [8] |  |  |
| UserLocation | 3GPP TS 29.571 [8] |  | UeMobility  Dispersion  E2eDataVolTransTime |
| VelocityEstimate | 3GPP TS 29.572 [30] | Velocity estimate | QoSSustainabilityExt\_eNA |
| Volume | 3GPP TS 29.122 [19] |  | UeCommunication  AbnormalBehaviour  Dispersion  WlanPerformance  PduSesTraffic  E2eDataVolTransTime |

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

##### 5.1.6.2.7 Type EventReportingRequirement

Table 5.1.6.2.7-1: Definition of type EventReportingRequirement

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

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