**3GPP TSG- Meeting #**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
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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:*** | Analytics accuracy monitoring procedures | | | | | | | | | |
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| ***Source to WG:*** | Nokia | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
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| ***Work item code:*** | eNA\_Ph3 | | | | |  | ***Date:*** | | | 2024-05-20 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories 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:*** | | Analytics Accuracy Monitoring procedures are specified in 23.288 clause 6.2D and the respective stage 3 signalling needs to be specified.  There is also an EN about this pending addition. | | | | | | | | |
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| ***Summary of change:*** | | Specified the Analytics Accuracy Monitoring procedures and removed the EN in 5.2.2.1, together with the related text, which is now covered in the new procedures. | | | | | | | | |
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| ***Consequences if not approved:*** | | Incomplete specification and not fulfilled stage 2 requirements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 5.2.2.1, 5.11 (new, including subclauses) | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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's revision history:*** | |  | | | | | | | | |

\*\*\* First Change \*\*\*

5.2.2.1 Analytics Subscribe/Unsubscribe/Notify initiated by 5GC NFs, OAM or AFs

This procedure is used in non-roaming case by the NF service consumers (i.e. NFs, OAM and AFs) to subscribe to/unsubscribe from analytics information directly from the NWDAF, it is also used by the NWDAF to notify the observed analytics event(s) to the NF service consumer if subscribed before.

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**Figure 5.2.2.1-1: Analytics Subscribe/Unsubscribe/Notify initiated by 5GC NFs, OAM or AFs**

1. In order to subscribe to notification(s) of analytics information from the NWDAF, the NF service consumer invokes Nnwdaf\_EventsSubscription\_Subscribe service operation by sending an HTTP POST request targeting the resource "NWDAF Events Subscriptions". The request includes the subscribed events and may include event filter information.

In order to update the existing subscription, the NF service consumer invokes Nnwdaf\_EventsSubscription\_Subscribe service operation by sending an HTTP PUT request with Resource URI of the resource "Individual NWDAF Event Subscription".

2. The NWDAF responds to the Nnwdaf\_EventsSubscription\_Subscribe service operation. Upon receipt of the HTTP POST request, if the subscription is accepted to be created, the NWDAF responds to the NF service consumer with "201 Created", and the URI of the created subscription is included in the Location header field.

Upon receipt of the HTTP PUT request, if the subscription is accepted to be updated, the NWDAF responds to the NF service consumer with "200 OK" or "204 No Content"

3. If the NWDAF observes the subscribed event(s), the NWDAF invokes Nnwdaf\_EventsSubscription\_Notify service operation to report the event(s) by sending an HTTP POST request with {notificationURI} as Notification URI.

4. The NF service consumer sends an HTTP "204 No Content" response to the NWDAF.

5. In order to unsubscribe to the notification(s) of analytics information from the NWDAF, the NF service consumer invokes Nnwdaf\_EventsSubscription\_Unsubscribe service operation by sending an HTTP DELETE request targeting the resource "Individual NWDAF Event Subscription", to the NWDAF to unsubscribe from analytics information. The request includes the event subscriptionId of the existing subscription that is to be deleted.

6. The NWDAF responds to the Nnwdaf\_EventsSubscription\_Unsubscribe service operation. If the unsubscription is accepted, the NWDAF responds with "204 No Content".

NOTE: For details of Nnwdaf\_EventsSubscription\_Subscribe/Unsubscribe/Notify service operations refer to 3GPP TS 29.520 [5].

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

5.11 Analytics Accuracy Monitoring Procedures

5.11.1 General

When multiple NWDAFs are deployed, some NWDAFs may be specialized with the analytics accuracy checking capability. When an NWDAF containing AnLF has the analytics accuracy checking capability, such an NWDAF is able to:

- Receive a subscription or a request for analytics via Nnwdaf\_EventsSubscription\_Subscribe or Nnwdaf\_AnalyticsInfo\_Request service operation with the indication for activating the mechanisms for checking the accuracy of such analytics as defined in 3GPP TS 29.520 [5] (see for example the "accuReq" attribute in 3GPP TS 29.520 [5] clause 5.1.6.2.3 and clause 5.2.6.2.3).

- Provide the accuracy information to the consumer via Nnwdaf\_EventsSubscription\_Notify or Nnwdaf\_AnalyticsInfo\_Request response service operationas defined in 3GPP TS 29.520 [5] (see for example the "accuInfo" attribute in 3GPP TS 29.520 [5] clause 5.1.6.2.5 and clause 5.2.6.2.2).

NOTE 1: In this version of the specification, NWDAF containing AnLF can provide accuracy information to an NF consumer that subscribes or requests for the analytics.

NOTE 2: When receiving a subscription from an NF consumer that includes a request for accuracy information, the analytics output and the accuracy information can be provided by NWDAF containing AnLF in a single notification or via separate notifications.

NOTE 3: 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.

NOTE 4: In this version of the specification, the subscription or request for accuracy information independently from requesting an analytics output is not supported.

The NWDAF containing AnLF starts the accuracy monitoring and generation of Analytics Accuracy Information based on local configuration or on NF service consumer requests which contain an explicit accuracy monitoring request or analytics feedback information. When the analytics accuracy checking is activated in an NWDAF containing the AnLF, the NWDAF may store for a period of time the necessary information to determine the analytics accuracy and provide the accuracy information to consumers when requested or use it for its internal processes.

5.11.2 Procedures for Analytics Accuracy Information Subscription

This procedure is used by NF service consumers to subscribe to receive analytics output and analytics accuracy information. Figure 5.11.2-1 shows the procedure for analytics accuracy information subscription and provisioning.

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**Figure 5.11.2-1: Analytics Accuracy Information Subscribe**

1. The analytics consumer performs a creation or a modification of an analytics subscription by invoking the Nnwdaf\_EventsSubscription\_Subscribe service operation as specified in 3GPP TS 29.520 [5], in which it triggers analytics accuracy monitoring as described in clause 5.11.1.

2. The NWDAF starts the analytics accuracy monitoring and generation of the analytics accuracy information as indicated in the subscription. If the NWDAF containing AnLF does not have enough necessary data, it will perform step 3b to collect ground truth data before computing analytics accuracy information. The NWDAF may have started to perform the analytics accuracy monitoring and analytics accuracy information generation triggered earlier by other analytics consumer(s). The NWDAF determines whether new data collection is needed based on the corresponding analytics subscription. In addition to the received request, the NWDAF may determine to start the analytics accuracy monitoring and analytics accuracy information generation based on local policy.

3a. The NWDAF performs the data collection required by the analytics subscription as described in clause 5.5 and generates the analytics output.

3b. The NWDAF performs the data collection (e.g., ground truth data collection) for accuracy information generation as described in clause 5.5 and generates the associated analytics accuracy information. If analytics feedback information is included in step 1, the NWDAF may take it into account and determine whether it affects the ground truth data by the internal logic to generate analytics accuracy information.

NOTE: This step can take place after step 4.

4. The NWDAF notifies the analytics consumer about the subscribed analytics and/or analytics accuracy information invoking the Nnwdaf\_EventsSubscription\_Notify service operation as described in 3GPP TS 29.520 [5], with the following options related to analytics accuracy monitoring:

a) providing only the the analytics output according to the parameters included in the subscription request.

b) providing the analytics accuracy Information together with the analytics output according to the parameters included in the subscription request.

c) providing only the analytics accuracy information according to the parameters included in the subscription request. The analytics accuracy information is provided in a separate notification (from the analytics output) when the requested periodicity for providing the analytics accuracy information is different from the requested periodicity for providing the analytics output, or when the accuracy value is under the analytics accuracy threshold indicated in the subscription request or locally configured.

d) when determining low or insufficient accuracy, i.e. the deviation of the analytics output using the trained ML Model from the ground truth data (which are collected from Data Producer NF at the time which the prediction refers to) does not meet the analytics accuracy requirement, thus indicating that the accuracy value is under the analytics accuracy threshold(s) (which are locally configured or received in the subscribe request), the NWDAF may notify the analytics consumer to stop analytics output consumption as described in 3GPP TS 29.520 [5] (see, for example, the "pauseInd" attribute in 3GPP TS 29.520 [5] clause 5.1.6.2.5).

5a. The analytics consumer may decide to stop the consumption of analytics output without terminating the analytics subscription, based on its own logic or based on a received notification from NWDAF (see previous step). The analytics consumer invokes then the Nnwdaf\_EventsSubscription\_Subscribe service operation to modify an existing subscription for this purpose as described in 3GPP TS 29.520 [5] (see, for example, the "pauseFlg" attribute in 3GPP TS 29.520 [5] clause 5.1.6.2.3).

5b. When the NWDAF determines an improvement in the monitored accuracy (e.g. meet the accuracy requirement of the analytics consumer) or based on internal logic, the NWDAF notifies the analytics consumer of the accuracy information indicating that it can resume the consumption of the analytics output by invoking the Nnwdaf\_EventsSubscription\_Notify service operation as described in 3GPP TS 29.520 [5] (see, for example, the "resumeInd" attribute in 3GPP TS 29.520 [5] clause 5.1.6.2.5).

5c. The analytics consumer based on a previously received notification (see previous step) or on internal logicm it may notify the NWDAF to resume the notification of analytics output by invoking the Nnwdaf\_EventsSubscription\_Subscribe as described in 3GPP TS 29.520 [5] (see, for example, the "resumeFlg" attribute in 3GPP TS 29.520 [5] clause 5.1.6.2.3).

5.11.3 Procedures for Analytics Accuracy Information Request

This procedure is used by NF service consumers to request analytics accuracy information. Figure 5.11.3-1 shows the procedure for accuracy information request and response.

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**Figure 5.11.3-1: Analytics Accuracy Information Request**

1. The analytics consumer performs an analytics request by invoking the Nnwdaf\_AnalyticsInfo\_Request service operation as specified in 3GPP TS 29.520 [5], in which it triggers analytics accuracy monitoring as described in clause 5.11.1.

2. Same as in clause 5.11.2.

3a. Same as in clause 5.11.2.

3b. Same as in clause 5.11.2, with the difference that analytics feedback information is not applicable.

NOTE: This step can take place after step 4.

4. The NWDAF provides the analytics output and/or analytics accuracy information in the response to the Nnwdaf\_AnalyticsInfo\_Request service operation as specified in 3GPP TS 29.520 [5] and further described in clause 5.11.1.

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