**3GPP TSG CT WG3 Meeting #137 C3-245265**

**Hefei, CN, 14 - 18 October, 2024 (revision of C3-245abc)**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **29.520** | **CR** | **0952** | **rev** | **-** | **Current version:** | **18.7.0** |  |
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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:*** | Resolve the Editor’s Note for analytics exchange in the roaming case | | | | | | | | | |
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| ***Source to WG:*** | Huawei, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNA\_Ph3 | | | | |  | ***Date:*** | | | 2024-09-25 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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)* | |
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| ***Reason for change:*** | | * The Editor’s Note for analytics exchange in the roaming case needs to be solved according to the stage 2 requirement defined in clauses 6.1.5, 6.2.10 and 6.2.11. * The Editor’s Note in clause 4.5.2.2.2 needs to be removed * The checking of the user consent is also applicable to the data collection in the roaming case.   This CR proposes to   * add a NOTE to speficy the checking of the user consent in the roaming case for data and analytics exchange; * update NOTE 2 in clause 4.5.2.2.2 to clarify the result if the NF service consumer and the NWDAF containing MTLF use different releases. | | | | | | | | |
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| ***Summary of change:*** | | * Remove the Editor’s Note in clause 4.5.2.2.2and 4.9.2.2.2. * add a Note to specify the checking of the user consent in the roaming case. | | | | | | | | |
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| ***Consequences if not approved:*** | | Open issue in the specification may lead to wrong implementation and interoperability issue. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.5.2.2.2, 4.8.2.2.2, 4.9.2.2.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | | The CR does not impact the OpenAPI file. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

\*\*\* 1st 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; and

2) event filter information as the "mLEventFilter" attribute;

and may include:

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

2) a time interval for which the ML model for the analytics is requested as the "mLTargetPeriod" attribute;

3) the time when the subscription expired as the "expiryTime" attribute;

4) the ML model metric as the "modelMetric" attribute if the "FederatedLearning" feature or the "ModelProvisionExt" feature is supported;

5) a pre-determined status for the ML model or training as the "preDetStatus" attribute if the "FederatedLearning" feature is supported; and

6) the ML event reporting condition as the "mlEvRepCon" if the "FederatedLearning" feature or the "ModelProvisionExt" feature is supported.

7) the ML Model Interoperability Information as the "modelInterInfo" attribute if the "ModelSharing" feature is supported; and

8) NF consumer information as the "nfConsumerInfo" attributed if the "ModelSharing" feature is supported.

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

NOTE 1: The NWDAF containing MTLF can use the "useCaseCxt" attribute to select the most relevant ML model, when several ML models are available for the requested Analytics ID(s). The values of this parameter are not standardized.

10) extended parameters for ML model provisioning as the "modelProvExt" attribute, if the feature "ModelProvisionExt" is supported;

11) UTC time indicating the time when the ML model is needed as the "timeModelNeeded" attribute.

12) the inference data stored in ADRF which can be used by MTLF as the "inferDataForModel" attribute, if the feature "ModelProvisionExt" is supported.

13) the ML model Identifier as the "modelId" attribute, if the feature "EnAnaCtxTransfer" is supported.

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 filter information in "mLEventFilter" attribute within the MLEventSubscription data type is the same as described in clause 4.3.2.2.2 for the filter information contained in "event-filter" attribute.

NOTE 2: The features described in clause 4.3.2.2.2 has no impact on this service, i.e. the features defined for the EventFilter data type will possibly not have corresponding features in this service. The result is that when the releases of which the NF service consumer and the NWDAF containing MTLF are different, the NF service consumer will possibly not know whether the NWDAF containing MTLF has considered all the filter information provided in the request message.

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 "eventReq" 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.

If not all the requested 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).

If there is no associated ML model available for all the listed "mLEvent" attribute, the NWDAF which contains MTLF shall send a "500 Internal Server Error" status code to the NF service consumer. Also, the corresponding failure reason via a "problemDetails" attribute with the "cause" attribute set to "UNAVAILABLE\_ML\_MODEL\_FOR\_ALLEVENTS".

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

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

##### 4.8.2.2.2 Subscription for event notifications

Figure 4.8.2.2.2-1 shows a scenario where the NF service consumer sends a request to the RE-NWDAF to subscribe for event notification(s).



Figure 4.8.2.2.2-1: NF service consumer subscribes to notifications

The NF service consumer shall invoke the Nnwdaf\_RoamingData\_Subscribe service operation to subscribe to event notification(s). The NF service consumer shall send an HTTP POST request with "{apiRoot}/nnwdaf-roamingdata/<apiVersion>/subscriptions" as Resource URI representing the "NWDAF Roaming Data Subscriptions", as shown in figure 4.8.2.2.2-1, step 1, to create a subscription for an "Individual NWDAF Roaming Data Subscription" according to the information in message body. The RoamingDataSub data structure provided in the request body shall include:

- the notification URI within "notificationUri" attribute;

- the notification correlation identifier within "notifCorrId" attribute;

- the PLMN ID of the consumer within "plmnId" attribute;

- either the analytics subscription information to be used by the NWDAF to determine the data that can be used to generate these analytics within the "anaSub" attribute or subscribed data events within the "dataSub" attribute;

and may include:

- formatting instructions within the "formatInstruct" attribute;

- processing instructions within the "procInstructs" attribute;

- time window of the occurrence of the requested data collection within the "timePeriod" attribute; and

- either a target NF identifier within the "targetNfId" attribute" or a target NF set identifier within the "targetNfSetId" attribute".

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

- create a new new subscription;

- assign a subscriptionId;

- store the subscription.

If the RE-NWDAF created an "Individual NWDAF Roaming Data Subscription" resource, the RE-NWDAF shall respond with "201 Created" with the message body containing a representation of the created subscription, as shown in figure 4.8.2.2.2-1, step 2. The RE-NWDAF shall include a Location HTTP header field. The Location header field shall contain the URI of the created profile, i.e. "{apiRoot}/nnwdaf-roamingdata/<apiVersion>/subscriptions/{subscriptionId}".

If an indication to perform immediate reporting is provided in the event subscription, the NWDAF shall include the reports of the events subscribed within "immReport" attribute, if available, in the HTTP POST response.

If the RE-NWDAF does not accept the request upon missing the corresponding roaming agreements, the RE-NWDAF shall reject the request with an HTTP "403 Forbidden" response including the "cause" attribute set to "MISSING\_ROAMING\_AGREEMENT".

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: The RE-NWDAF checks the user consent as defined in clause X.7 and Annex V of TS 33.501 [13] and protection of analytics exchange in roaming case as defined in clause X.8 of TS 33.501 [13].If an error occurs when processing the HTTP POST request, the RE-NWDAF shall send an HTTP error response as specified in clause 5.7.7.

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

##### 4.9.2.2.2 Subscription for event notifications

Figure 4.9.2.2.2-1 shows a scenario where the NF service consumer sends a request to the RE-NWDAF to subscribe for event notification(s).



Figure 4.9.2.2.2-1: NF service consumer subscribes to notifications

The NF service consumer shall invoke the Nnwdaf\_RoamingAnalytics\_Subscribe service operation to subscribe to event notification(s) related to roaming UE(s) by sending an HTTP POST request with "{apiRoot}/nnwdaf-roaminganalytics/<apiVersion>/subscriptions" as Resource URI representing the "NWDAF Roaming Analytics Subscriptions" resource, as shown in figure 4.9.2.2.2-1, step 1, to create an "Individual NWDAF Roaming Analytics Subscription" resource according to the information in message body. The RoamingAnalyticsSubscription data structure provided in the request body shall include:

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

- a notification correlation identifier as "notifCorrId" attribute;

- the PLMN ID of the NF service consumer as "consPlmnId" attribute;

- a description of the subscribed events as "roamEventSubs" attribute with the same contents as specified for the "eventSubscriptions" attribute in clause 4.2.2.2.2 but excluding the attributes that are indicated as non applicable in Table 5.7.6.2.2-1.

NOTE 1: The features mentioned in clause 4.2.2.2.2 are not relevant here.

and may include:

- event reporting information as the "evtReq" attribute with the same contents as specified for the "evtReq" attribute in clause 4.2.2.2.2.

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

- create a new subscription;

- assign an event subscriptionId; and

- store the subscription.

If the RE-NWDAF created an "Individual NWDAF Roaming Analytics Subscription" resource, the RE-NWDAF shall respond with "201 Created" status code with the message body containing a representation of the created subscription, as shown in figure 4.9.2.2.2-1, 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-roaminganalytics/<apiVersion>/subscriptions/{subscriptionId}". If the immediate reporting indication in the "immRep" attribute within the "evtReq" attribute was set to true in the event subscription, the RE-NWDAF shall include the reports of the events subscribed, if available, in the HTTP POST response within the "roamEventNotifs" attribute.

When the "notifFlag" attribute is included and set to "DEACTIVATE" in the request, the RE-NWDAF shall mute the event notification and store the available events until the NF service consumer requests to retrieve them by setting the "notifFlag" attribute to "RETRIEVAL" or until a muting exception occurs (e.g. full buffer).

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

If the RE-NWDAF does not accept the upon missing the corresponding roaming agreements, the RE-NWDAF shall reject the request with an HTTP "403 Forbidden" response including the "cause" attribute set to "MISSING\_ROAMING\_AGREEMENT".

If the statistics in the past are requested but the necessary data to perform the service is unavailable, the RE-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 2: The RE-NWDAF checks the user consent for analytics as defined in clause X.7 and Annex V of TS 33.501 [13] and protection of analytics exchange in roaming case as defined in clause X.8 of TS 33.501 [13].

If an error occurs when processing the HTTP POST request, the NWDAF shall send an HTTP error response as specified in clause 5.8.7.

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