**3GPP TSG-CT WG3 Meeting #128 *C3-232210***

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

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.520** | **CR** | **0721** | **rev** | **-** | **Current version:** | **17.10.0** |  |
|  | | | | | | | | |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Corrections on the validity period in the analytics | | | | | | | | | |
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| ***Source to WG:*** | Huawei, Nokia, Nokia Shanghai Bell, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNA\_Ph2 | | | | |  | ***Date:*** | | | 2023-05-05 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | Clarifications were added to the validity period in the analytics in S2-2304891. The descriptions of the corresponding attributes in stage 3 need to be updated to reflect the impacts. | | | | | | | | |
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| ***Summary of change:*** | | Add NOTE for "start" and "expiry" attributes to indicate that the validity period is determined by NWDAF internal logic and is a subset of Analytics target period. | | | | | | | | |
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| ***Consequences if not approved:*** | | The validity period may be provided in an incorrect manner. | | | | | | | | |
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| ***Clauses affected:*** | | 4.2.2.4.2, 5.1.6.2.5, 5.2.6.2.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS/TR 23.288 CR 0791 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR does not impact any OpenAPI file. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

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

##### 4.2.2.4.2 Notification about subscribed event

Figure 4.2.2.4.2-1 shows a scenario where the NWDAF sends a request to the NF service consumer to notify for event notifications or notify for the successful analytics subscription transfer (see also 3GPP TS 23.288 [17]).



Figure 4.2.2.4.2-1: NWDAF notifies the subscribed event

The NWDAF shall invoke the Nnwdaf\_EventsSubscription\_Notify service operation to notify the subscribed event or the successful analytics subscription transfer. The NWDAF shall send an HTTP POST request with "{notificationURI}" received in the Nnwdaf\_EventsSubscription\_Subscribe service operation as Resource URI, as shown in figure 4.2.2.4.2-1, step 1.

If both the repetition period ("repPeriod" or "repetitionPeriod") attribute and the "offsetPeriod" attribute are present in the subscription request for periodical notification, the NWDAF shall produce a notification in every repetition period seconds, including the statistics in the past offset period if the "offsetPeriod" attribute value is negative, or including the prediction for the future offset period if the "offsetPeriod" attribute value is positive.

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

- If the notification is for notifying about subscribed events, a description of the notified event as "eventNotifications" attribute that for each event shall include:

a) an event identifier as "event" attribute;

b) network slice load level information in the "sliceLoadLevelInfo" attribute when subscribed event is "SLICE\_LOAD\_LEVEL";

c) service experience information as "svcExps" attribute when subscribed event is "SERVICE\_EXPERIENCE";

d) UE mobility information in the "ueMobs" attribute when subscribed event is "UE\_MOBILITY";

e) UE communication information in the "ueComms" attribute when subscribed event is "UE\_COMM";

f) abnormal behaviour information in the "abnorBehavrs" attribute when subscribed event is "ABNORMAL\_BEHAVIOUR";

g) user data congestion information in the "userDataCongInfos" attribute when subscribed event is "USER\_DATA\_CONGESTION";

h) QoS sustainability information in the "qosSustainInfos" attribute when subscribed event is "QOS\_SUSTAINABILITY";

i) NF load information in "nfLoadLevelInfos" attribute when subscribed event is "NF\_LOAD";

j) network performance information in the "nwPerfs" attribute when subscribed event is "NETWORK\_PERFORMANCE";

k) Load level information for the network slice(s) and the optionally associated network slice instance(s) in "nsiLoadLevelInfos" attribute when subscribed event is "NSI\_LOAD\_LEVEL";

l) Dispersion information in the "disperInfos" attribute when subscribed event is "DISPERSION";

m) Redundant transmission experience information in the "redTransInfos" attribute when subscribed event is "RED\_TRANS\_EXP";

n) WLAN performance information in the "wlanInfos" attribute when subscribed event is "WLAN\_PERFORMANCE";

o) DN performance information in the "DnPerformance" attribute when subscribed event is "DN\_PERFORMANCE"; and

p) SMCCE performance information in the "smccExps" attribute when subscribed event is "SM\_CONGESTION";

and may include:

a) information about analytics metadata required for aggregation of the analytics in the "anaMetaInfo" attribute if the feature "Aggregation" is supported;

b) the start time of which the analytics information is valid in the "start" attribute;

c) the expiration time after which the analytics information will become invalid in the "expiry" attribute.

- If the "EneNA" feature is supported and the target NWDAF notifies a successful analytics subscription transfer, the old subscription ID which had been allocated by the source NWDAF within the "oldSubscriptionId" attribute and the resource URI of the Individual NWDAF Event Subscription resource created by the target NWDAF within "resourceUri" attribute, and if the "PartialAnalyticsSubTransfer" feature is supported and not all the analytics events in the subscription transfer are accepted, the failure event(s) within the "failTransEventReports" attribute; and

- an event subscription Id as "subscriptionId" attribute;

and may include:

a) the notification correlation identifier in the "notifCorrId" attribute, if the "EneNA" feature is supported.

b) a cause for termination in the "termCause" attribute, if the "TermRequest" feature is supported and the NWDAF wants to request the termination of this subscription, i.e. to indicate that it will send no further notifications for it.

If the feature "EneNA" is supported and the time when analytics information is needed has been provided (via the "timeAnaNeeded" attribute within the "extraReportReq" attribute) during the subscription for an event (via the "event" attribute within the EventSubscription data type), if the time when analytics information is needed is reached but the subscribed analytics information is not ready, the consumer does not need to wait for the analytics information any longer. In this case, the NWDAF may send an HTTP POST request as shown in step 1 of figure 4.2.2.4.2-1, which shall only provide (within the EventNotification data type in the NnwdafEventsSubscriptionNotification data type) an indication of the failure event via the "event" attribute and the corresponding failure reason via a "failNotifyCode" attribute, and may also provide a minimum time interval recommended by the NWDAF for the event via a "rvWaitTime" attribute which will be used by the NF service consumer to determine the time when analytics information is needed in similar future analytics subscriptions.

Upon the reception of an HTTP POST request with: "{notificationURI}" as Resource URI and NnwdafEventsSubscriptionNotification data structure as request body, if the NF service consumer successfully processed and accepted the received HTTP POST request, the NF service consumer shall:

- store the notification; and

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

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

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

After the successful processing of the HTTP POST request, if the NWDAF requests the NF service consumer to retrieve the data or analytics with the "fetchInstruct" attribute, the NF service consumer may invoke the Nnwdaf\_DataManagement\_Fetch service operation to retrieve the notified data or analytics as defined in clause 4.4.2.5.

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

##### 5.1.6.2.5 Type EventNotification

Table 5.1.6.2.5-1: Definition of type EventNotification

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| event | NwdafEvent | M | 1 | Event that is notified. |  |
| start | DateTime | O | 0..1 | It defines the start time of which the statistics analytics information is applicable or predictions analytics information is valid. (NOTE 1) (NOTE 4) |  |
| expiry | DateTime | O | 0..1 | It defines the expiration time after which the statistics analytics information is applicable or predictions analytics information is invalid. (NOTE 1) (NOTE 4) |  |
| timeStampGen | DateTime | C | 0..1 | It defines the timestamp of analytics generation. (NOTE 3) |  |
| failNotifyCode | NwdafFailureCode | C | 0..1 | Identifies the failure reason for the event notification.  It shall only be included if the event notification is failed or the analytics information is not ready. (NOTE 2) | EneNA |
| rvWaitTime | DurationSec | O | 0..1 | Indicate a recommended time interval (in seconds) which is used to determine the time when analytics information is needed in similar future event subscriptions. It may only be included if the "failNotifyCode" attribute sets to "UNSATISFIED\_REQUESTED\_ANALYTICS\_TIME". | EneNA |
| anaMetaInfo | AnalyticsMetadataInfo | C | 0..1 | Contains information about analytics metadata required to aggregate the analytics. It shall be present if the "anaMeta" attribute was included in the subscription, containing the information indicated by the "anaMeta" attribute. | Aggregation |
| nwPerfs | array(NetworkPerfInfo) | C | 1..N | The network performance information.  Shall be present when subscribed even is "NETWORK\_PERFORMANCE". | NetworkPerformance |
| nfLoadLevelInfos | array(NfLoadLevelInformation) | C | 1..N | The NF load level information. When subscribed event is "NF\_LOAD", the nfLoadLevelInfos shall be included. | NfLoad |
| nsiLoadLevelInfos | array(NsiLoadLevelInfo) | C | 1..N | Each element identifies the load level information for each S-NSSAI and the optionally associated network slice instance.  Shall be included when subscribed event is "NSI\_LOAD\_LEVEL". | NsiLoad |
| qosSustainInfos | array(QosSustainabilityInfo) | C | 1..N | The QoS sustainability information.  When subscribed event is "QOS\_SUSTAINABILITY", the qosSustainInfos shall be included. | QoSSustainability |
| sliceLoadLevelInfo | SliceLoadLevelInformation | C | 0..1 | The slices and the load level information.  When subscribed event is "SLICE\_LOAD\_LEVEL", the sliceLoadLevelInfo shall be included. |  |
| svcExps | array(ServiceExperienceInfo) | C | 1..N | The service experience information.  When subscribed event is "SERVICE\_EXPERIENCE", the svcExps shall be included. | ServiceExperience |
| ueComms | array(UeCommunication) | C | 1..N | The UE communication information.  When subscribed event is "UE\_COMM", the ueComms shall be included. | UeCommunication |
| ueMobs | array(UeMobility) | C | 1..N | The UE mobility information.  When subscribed event is "UE\_MOBILITY", the ueMobs shall be included. | UeMobility |
| abnorBehavrs | array(AbnormalBehaviour) | C | 1..N | The Abnormal Behaviour information.  When subscribed event is "ABNORMAL\_BEHAVIOUR", the abnorBehavrs shall be included. | AbnormalBehaviour |
| userDataCongInfos | array(UserDataCongestionInfo) | C | 1..N | The location and user data congestion information.  Shall be present if the subscribed event is "USER\_DATA\_CONGESTION". | UserDataCongestion |
| dnPerfInfos | array(DnPerfInfo) | C | 1..N | The DN performance information.  Shall be present if the subscribed event is "DN\_PERFORMANCE". | DnPerformance |
| disperInfos | array(DispersionInfo) | C | 1..N | The Dispersion information.  When subscribed event is "DISPERSION", the "disperInfos" attribute shall be included. | Dispersion |
| redTransInfos | array(RedundantTransmissionExpInfo) | C | 1..N | The redundant transmission experience related information.  When subscribed event is "RED\_TRANS\_EXP", the "redTransInfos" attribute shall be included. | RedundantTransmissionExp |
| wlanInfos | array(WlanPerformanceInfo) | C | 1..N | The WLAN performance related information.  When subscribed event is "WLAN\_PERFORMANCE", the "wlanInfos" attribute shall be included. | WlanPerformance |
| smccExps | array(SmcceInfo) | C | 1..N | The Session Management Congestion Control Experience information.  Shall be present when the requested event is "SM\_CONGESTION". | SMCCE |
| NOTE 1: If the "start" attribute and the "expiry" attribute are both provided, the DateTime of the "expiry" attribute shall not be earlier than the DateTime of the "start" attribute.  NOTE 2: The values of "UNAVAILABLE\_DATA" and "BOTH\_STAT\_PRED\_NOT\_ALLOWED" of the NwdafFailureCode data type are not applicable for the "failNotifyCode" attribute.  NOTE 3: This attribute shall be included when ADRF is deployed.  NOTE 4: The validity period specified by "start" and "expiry" attributes is determined by NWDAF internal logic, and is a subset of the analytics target period indicated by "startTs" and "endTs", or "offsetPeriod" attributes contained in "ana-req" attribute. If the analytics target period refers to the past, the period specified by these two attributes indicate the time period over which the statistics are applicable. If the analytics target period refers to the future, the period specified by these two attributes indicate the time period over which the predictions are valid. | | | | | |

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

##### 5.2.6.2.2 Type AnalyticsData

Table 5.2.6.2.2-1: Definition of type AnalyticsData

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| start | DateTime | O | 0..1 | It defines the start time of which the statistics analytics information is applicable or predictions analytics information is valid. (NOTE 1) (NOTE 4) |  |
| expiry | DateTime | O | 0..1 | It defines the expiration time after which the statistics analytics information is applicable or predictions analytics information is invalid. (NOTE 1) (NOTE 4) |  |
| timeStampGen | DateTime | C | 0..1 | It defines the timestamp of analytics generation. (NOTE 3) |  |
| anaMetaInfo | AnalyticsMetadataInfo | C | 0..1 | Contains information about analytics metadata required to aggregate the analytics. It shall be present if the "anaMeta" attribute was included in the request, containing the information indicated by the "anaMeta" attribute. | Aggregation |
| sliceLoadLevelInfos | array(SliceLoadLevelInformation) | C | 1..N | The slices and the load level information. Shall be present when the requested event is "LOAD\_LEVEL\_INFORMATION". |  |
| nsiLoadLevelInfos | array(NsiLoadLevelInfo) | C | 1..N | Each element identifies the load level information for an S-NSSAI and the optionally associated network slice instance.  Shall be presented when the requested event is "NSI\_LOAD\_LEVEL" | NsiLoad |
| nwPerfs | array(NetworkPerfInfo) | C | 1..N | The network performance information.  Shall be present when the requested event is "NETWORK\_PERFORMANCE". | NetworkPerformance |
| nfLoadLevelInfos | array(NfLoadLevelInformation) | C | 1..N | The NF load information.  When the requestedevent is "NF\_LOAD", the nfLoadLevelInfos shall be included. | NfLoad |
| qosSustainInfos | array(QosSustainabilityInfo) | C | 1..N | The QoS sustainability informations in the certain geographic areas.  It shall be present if the requested eventis "QOS\_SUSTAINABILITY".  (NOTE 2) | QoSSustainability |
| ueMobs | array(UeMobility) | C | 1..N | The UE mobility information.  When the requested event is "UE\_MOBILITY", the "ueMobs" attribute shall be included. | UeMobility |
| ueComms | array(UeCommunication) | C | 1..N | The UE communication information.  When the requested event is "UE\_COMM", the "ueComms" attribute shall be included. | UeCommunication |
| userDataCongInfos | array(UserDataCongestionInfo) | C | 1..N | The user data congestion information.  Shall be present when the requested event is "USER\_DATA\_CONGESTION". | UserDataCongestion |
| suppFeat | SupportedFeatures | C | 0..1 | List of Supported features used as described in clause 5.2.8.  This parameter shall be supplied by NWDAF in the reply of GET request that request the analytics resource, if the consumer includes "supported-features" in the GET request. |  |
| svcExps | array(ServiceExperienceInfo) | C | 1..N | The service experience information.  Shall be present when the requested event is "SERVICE\_EXPERIENCE". | ServiceExperience |
| abnorBehavrs | array(AbnormalBehaviour) | C | 1..N | The abnormal behaviour information.  Shall be present when the requested event is "ABNORMAL\_BEHAVIOUR". | AbnormalBehaviour |
| smccExps | array(SmcceInfo) | C | 1..N | The Session Management congestion control experience information.  Shall be present when the requested event is "SM\_CONGESTION". | SMCCE |
| disperInfos | array(DispersionInfo) | C | 1..N | The Dispersion information.  Shall be present when the requested event is "DISPERSION". | Dispersion |
| redTransInfos | array(RedundantTransmissionExpInfo) | C | 1..N | The Redundant Transmission Experience analytics information.  Shall be present when the requested event is "RED\_TRANS\_EXP". | RedundantTransmissionExp |
| wlanInfos | array(WlanPerformanceInfo) | C | 1..N | The WLAN performance related information.  When requested event is "WLAN\_PERFORMANCE", the "wlanInfos" attribute shall be included. | WlanPerformance |
| dnPerfInfos | array(DnPerfInfo) | C | 1..N | The DN performance information.  Shall be present when the requested event is "DN\_PERFORMANCE". | DnPerformance |
| NOTE 1: If the "start" attribute and the "expiry" attribute are both provided, the DateTime of the "expiry" attribute shall not be earlier than the DateTime of the "start" attribute.  NOTE 2: The "qosFlowRetThd" and "ranUeThrouThd" attributes in QosSustainabilityInfo data type are not applicable.  NOTE 3: This attribute shall be included when ADRF is deployed.  NOTE 4: The validity period specified by "start" and "expiry" attributes is determined by NWDAF internal logic, and is a subset of the analytics target period indicated by "startTs" and "endTs", or "offsetPeriod" attributes contained in "ana-req" attribute. If the analytics target period refers to the past, the period specified by these two attributes indicate the time period over which the statistics are applicable. If the analytics target period refers to the future, the period specified by these two attributes indicate the time period over which the predictions are valid. | | | | | |

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