**SA WG2 Meeting #138ES2-2003047**

**April 20 - 24, 2020, Elbonia (merge with S2-2002747, revision of S2-20xxxxx)**

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| *CR-Form-v12.0* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.288** | **CR** | **0172** | **rev** | **-** | **Current version:** | **16.3.0** |  |
|  | | | | | | | | |
| *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 to Nnwdaf service operations | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Samsung | | | | | | | | | |
| ***Source to TSG:*** | S2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNA | | | | |  | ***Date:*** | | | 2020-04-10 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-16 |
|  | *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-12 (Release 12)* *Rel-13 (Release 13) Rel-14 (Release 14) Rel-15 (Release 15) Rel-16 (Release 16)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | There are a couple of parameters missing from the NWDAF service operations specification in clause 7:  - Reporting Thresholds, Maximum number of objects and Maximum number of SUPIs can be used by the analytics consumer as inputs for Nnwdaf\_AnalyticsSubscription\_Subscribe and can be provided per individual Analytics ID.  - Maximum number of objects and Maximum number of SUPIs can be used by the analytics consumer as inputs for Nnwdaf\_AnalyticsInfo\_Request and can be provided per individual Analytics ID.  - Validity period missing from Nnwdaf\_AnalyticsSubscription\_Notify and as output for Nnwdaf\_AnalyticsInfo\_Request.  Nnwdaf\_AnalyticsSubscription\_Notify and output for Nnwdaf\_AnalyticsInfo\_Request refer to "Timestamp for the analytics information" while clause 6.1.3 refers to "timestamp of analytics generation".  The notes added via agreed CR in S2-2001989 (SA2#137E) should also apply to Nnwdaf\_AnalyticsInfo\_Request, i.e. Target of Analytics Reporting can be provided per individual Analytics ID in a set of Analytics IDs, and Analytics Filter Information can be provided per individual Analytics ID in a set of Analytics IDs. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | - Reporting Thresholds, Maximum number of objects and Maximum number of SUPIs added as inputs for Nnwdaf\_AnalyticsSubscription\_Subscribe and a note clarifies that these can be provided per individual Analytics ID.  - Maximum number of objects and Maximum number of SUPIs added as inputs for Nnwdaf\_AnalyticsInfo\_Request and a note clarifies that these can be provided per individual Analytics ID.  - Validity period added as input to Nnwdaf\_AnalyticsSubscription\_Notify and as output for Nnwdaf\_AnalyticsInfo\_Request, with a note clarifying that Validity period can also be provided as part of Analytics specific parameters for some NWDAF output analytics.  - Notes added to Nnwdaf\_AnalyticsInfo\_Request description to clarify that Target of Analytics Reporting can be provided per individual Analytics ID in a set of Analytics IDs, and Analytics Filter Information can be provided per individual Analytics ID in a set of Analytics IDs.  In 7.1, the response description for observed service experience analytics is aligned with general description in clause 6.4.1, i.e. the Observed Service Experience analytics may provide one or both of the following:  - Service Experience for a Network Slice  - Service Experience for an Application  The details regarding network slice instances can be left to the output analytics tables in 6.4.3. | | | | | | | | |
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| ***Consequences if not approved:*** | | Incomplete service operations specification leading to issues at stage 3. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 7.1, 7.2.2, 7.2.4, 7.3.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

*FIRST CHANGE (1)*

## 7.1 General

The following table illustrates the NWDAF Services.

Table 7.1-1: NF services provided by NWDAF

|  |  |  |  |
| --- | --- | --- | --- |
| Service Name | Service Operations | Operation  Semantics | Example Consumer(s) |
| Nnwdaf\_AnalyticsSubscription | Subscribe | Subscribe / Notify | PCF, NSSF, AMF, SMF, NEF, AF |
|  | Unsubscribe |  | PCF, NSSF, AMF, SMF, NEF, AF |
|  | Notify |  | PCF, NSSF, AMF, SMF, NEF, AF |
| Nnwdaf\_AnalyticsInfo | Request | Request / Response | PCF, NSSF, AMF, SMF, NEF, AF |

The following table shows the analytics information provided by NWDAF service:

Table 7.1-2: Analytics information provided by NWDAF

|  |  |  |
| --- | --- | --- |
| Analytics Information | Request Description | Response Description |
| Slice Load level information | Analytics ID: load level information | Load level of a Network Slice Instance reported either as notification of crossing of a given threshold or as periodic notification (if no threshold is provided). |
| Observed Service experience information | Analytics ID: Service Experience | Observed Service experience statistics or predictions may be provided for a Network Slice or an Application. They may be derived from an individual UE, a group of UEs or any UE. For slice service experience, they may be derived from an Application, a set of Applications or all Applications on the Network Slice. |
| NF Load information | Analytics ID: NF load information | Load statistics or predictions information for specific NF(s). |
| Network Performance information | Analytics ID: Network Performance | Statistics or predictions on the load in an Area of Interest; in addition, statistics or predictions on the number of UEs that are located in that Area of Interest. |
| UE mobility information | Analytics ID: UE Mobility | Statistics or predictions on UE mobility. |
| UE Communication information | Analytics ID: UE Communication | Statistics or predictions on UE communication. |
| Expected UE behavioural parameters | Analytics ID: UE Mobility and/or UE Communication | Analytics on UE Mobility and/or UE Communication. |
| UE Abnormal behaviour information | Analytics ID: Abnormal behaviour | List of observed or expected exceptions, with Exception ID, Exception Level and other information, depending on the observed or expected exceptions. |
| User Data Congestion information | Analytics ID: User Data Congestion | Statistics or predictions on the user data congestion for transfer over the user plane, for transfer over the control plane, or for both. |
| QoS Sustainability | Analytics ID: QoS Sustainability | For statistics, the information on the location and the time for the QoS change and the threshold(s) that were crossed; or, for predictions, the information on the location and the time when a potential QoS change may occur and what threshold(s) may be crossed. |

*NEXT CHANGE (2)*

### 7.2.2 Nnwdaf\_AnalyticsSubscription\_Subscribe service operation

**Service operation name:** Nnwdaf\_AnalyticsSubscription\_Subscribe.

**Description:** Subscribes to NWDAF analytics with specific parameters.

**Inputs, Required:** (Set of) Analytics ID(s) defined in Table 7.1-2, Target of Analytics Reporting, Notification Target Address (+ Notification Correlation ID), Analytics Reporting Parameters, Analytics target period.

NOTE 1: Target of Analytics Reporting can be provided per individual Analytics ID in a set of Analytics IDs.

**Inputs, Optional:** Analytics Filter Information, Subscription Correlation ID (in the case of modification of the analytics subscription), preferred level of accuracy of the analytics, Reporting Thresholds, Maximum number of objects requested (max), Maximum number of SUPIs requested (SUPImax).

NOTE 2: Analytics Filter Information, Reporting Thresholds, Maximum number of objects requested (max) and Maximum number of SUPIs requested (SUPImax) can be provided per individual Analytics ID in a set of Analytics IDs.

**Outputs Required:** When the subscription is accepted: Subscription Correlation ID (required for management of this subscription).

**Outputs, Optional:** None.

*NEXT CHANGE (3)*

### 7.2.4 Nnwdaf\_AnalyticsSubscription\_Notify service operation

**Service operation name:** Nnwdaf\_AnalyticsSubscription\_Notify.

**Description:** NWDAF notifies the consumer instance of the analytics that has subscribed to the specific NWDAF service.

**Inputs, Required:** Set of the tuple (Analytics ID, Analytics specific parameters), Notification Correlation Information.

**Inputs, Optional:** Timestamp of analytics generation, validity period, probability assertion.

NOTE 1: Some NWDAF output analytics already include confidence of predictions, which provides the same information as probability assertion.

NOTE 2: Validity period can also be provided as part of Analytics specific parameters for some NWDAF output analytics.

**Outputs, Required:** Operation execution result indication.

**Outputs, Optional:** None.

*NEXT CHANGE (4)*

### 7.3.2 Nnwdaf\_AnalyticsInfo\_Request service operation

**Service operation name:** Nnwdaf\_AnalyticsInfo\_Request.

**Description:** the consumer requests NWDAF operator specific analytics.

**Inputs, Required:** (Set of) Analytics ID(s) defined in Table 7.1-2, Target of Analytics Reporting, Analytics target period.

NOTE 1: Target of Analytics Reporting can be provided per individual Analytics ID in a set of Analytics IDs.

**Inputs, Optional:** Analytics Filter Information, preferred level of accuracy of the analytics, time when analytics information is needed, Maximum number of objects requested (max), Maximum number of SUPIs requested (SUPImax).

NOTE 2: Analytics Filter Information, Maximum number of objects requested (max) and Maximum number of SUPIs requested (SUPImax) can be provided per individual Analytics ID in a set of Analytics IDs.

**Outputs, Required:** Set of the tuple (Analytics ID, Analytics specific parameters).

**Outputs, Optional:** Timestamp of analytics generation, validity period, probability assertion.

NOTE 3: Some NWDAF output analytics already include confidence of predictions, which provides the same information as probability assertion.

NOTE 4: Validity period can also be provided as part of Analytics specific parameters for some NWDAF output analytics.

*END OF CHANGES*