**3GPP TSG- Meeting #**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  |  | **CR** |  | **rev** |  | **Current version:** |  |  |
|  |
| *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:***  |  |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** | C3 |
|  |  |
| ***Work item code:*** |  |  | ***Date:*** |  |
|  |  |  |  |  |
| ***Category:*** |  |  | ***Release:*** |  |
|  | *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 canbe 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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | TS 23.288 clause 6.1B has specified how to perform transfer of context related to analytics subscriptions, with the respective functionality added via a new service operation (Nnwdaf\_AnalyticsInfo\_ContextTransfer, see TS 23.288 clause 7.3.3). This needs to be implemented by extending the Nnwdaf\_AnalyticsInfo API accordingly. |
|  |  |
| ***Summary of change:*** | Updated general sections to add the ContextTransfer operation in Nnwdaf\_AnalyticsInfo and describe its capabilities. |
|  |  |
| ***Consequences if not approved:*** | Stage 2 requirements not fulfilled. |
|  |  |
| ***Clauses affected:*** | 4.1, 4.3.1.1, 4.3.1.3.1, 4.3.1.3.2, 4.3.2.1 |
|  |  |
|  | **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 has no impact on any OpenAPI file. |
|  |  |
| ***This CR's revision history:*** |  |

\* \* \* \* First change \* \* \* \*

## 4.1 Introduction

The Nnwdaf services are used for the NWDAF to provide specific analytics information.

Analytics information is either statistical information of past events, or predictive information.

The following services are specified for the NWDAF:

Table 4.1-1: Services provided by NWDAF

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Service Name | Description | Service Operations | OperationSemantics | Example Consumer(s) |
| Nnwdaf\_EventsSubscription(NOTE) | This service enables the NF service consumers to subscribe to/unsubscribe from notifications for different analytics information from the NWDAF. | Subscribe | Subscribe / Notify | PCF, NSSF, AMF, SMF, NEF, UDM, AF, OAM, CEF, NWDAF |
| Unsubscribe |
| Notify |
| Nnwdaf\_AnalyticsInfo | This service enables the NF service consumers to request and get specific analytics or context information related to analytics subscriptions from the NWDAF. | Request | Request / Response | PCF, NSSF, AMF, SMF, NEF, UDM, AF, OAM, NWDAF |
| ContextTransfer | Request / Response | NWDAF |
| Nnwdaf\_DataManagement | This service enables the NF service consumers to subscribe to/unsubscribe from notifications when subscribed event(s) are detected or retrieve the subscribed data from the NWDAF. | Subscribe | Subscribe / Notify | NWDAF, DCCF, MFAF |
| Unsubscribe |  |  |
| Notify |  |  |
| Fetch | Request / Response | NWDAF, DCCF, MFAF |
| Nnwdaf\_MLModelProvision | This service enables the NF service consumers to subscribe to/unsubscribe from notifications when a ML model matching the subscription parameters becomes available. | Subscribe | Subscribe / Notify | NWDAF |
| Unsubscribe |
| Notify |
| NOTE: This service corresponds to the Nnwdaf\_AnalyticsSubscription service defined in 3GPP TS 23.288 [17]. |

Table 4.1-2 summarizes the corresponding APIs defined in this specification.

Table 4.1-2: API Descriptions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Service Name | Clause | Description | OpenAPI Specification File | apiName | Annex |
| Nnwdaf\_EventsSubscription | 5.1 | Nnwdaf Events Subscription Service. | TS29520\_Nnwdaf\_EventsSubscription.yaml | nnwdaf-eventssubscription | A.2 |
| Nnwdaf\_AnalyticsInfo | 5.2 | Nnwdaf Analytics Information Service | TS29520\_Nnwdaf\_AnalyticsInfo.yaml | nnwdaf-analyticsinfo | A.3 |
| Nnwdaf\_DataManagement | 5.3 | NWDAF Data Management Service | TS29520\_Nnwdaf\_DataManagement.yaml | nnwdaf-datamanagement | A.4 |
| Nnwdaf\_MLModelProvision | 5.4 | NWDAF ML Model Provision Service | TS29520\_Nnwdaf\_MLModelProvision.yaml | nnwdaf-mlmodelprovision | A.5 |

\* \* \* \* Next change \* \* \* \*

#### 4.3.1.1 Overview

The Nnwdaf\_AnalyticsInfo Service as defined in 3GPP TS 23.501 [2], 3GPP TS 23.288 [17] and 3GPP TS 23.503 [4], is provided by the Network Data Analytics Function (NWDAF).

This service:

- allows NF consumers to request and get different type of analytic event information.

- allows NF consumers to request and get context information related to analytics subscriptions.

The types of observed events include:

- Slice load level information;

- Network slice instance load level information;

- Service experience;

- NF load;

- Network performance;

- Abnormal behaviour;

- UE mobility;

- UE communication;

- User data congestion; and

- QoS sustainability.

\* \* \* \* Next change \* \* \* \*

##### 4.3.1.3.1 Network Data Analytics Function (NWDAF)

The Network Data Analytics Function (NWDAF) provides specific analytics information for different analytic events and, if the "EneNA" feature is supported, context information related to analytics subscriptions to NF consumers.

\* \* \* \* Next change \* \* \* \*

##### 4.3.1.3.2 NF Service Consumers

The Policy Control Function (PCF):

- supports taking analytics information for slice load level information from the NWDAF;

- supports taking analytics information for service experience related network data from the NWDAF;

- supports taking analytics information for network performance from the NWDAF;

- supports taking analytics information for abnormal UE behaviour from the NWDAF;

- supports taking one or more above input from NWDAF into consideration for policies on assignment of network resources and/or for traffic steering policies.

NOTE: How this information is used by the PCF is not standardized in this release of the specification.

The Network Slice Selection Function (NSSF):

- supports taking slice load level information or network slice instance load level information from NWDAF into consideration for slice selection.

- supports taking analytics information for service experience related network data from the NWDAF;

The Access and Mobility Management Function (AMF):

- supports taking SMF load information from NWDAF into consideration for SMF selection;

- supports taking expected UE behaviour information (UE mobility and/or UE communication) from NWDAF into consideration for monitoring UE behaviour;

- supports taking abnormal UE behaviour information from NWDAF into consideration for adjustment of UE mobility related network parameters to solve the abnormal risk.

- supports taking slice load level information or network slice instance load level information from NWDAF into consideration for slice selection.

- supports taking analytics information for service experience related network data from the NWDAF;

The Session Management Function (SMF):

- supports taking UPF load information from NWDAF into consideration for UPF selection;

- supports taking expected UE behaviour information (UE mobility and/or UE communication) from NWDAF into consideration for monitoring UE behaviour;

- supports taking abnormal UE behaviour information from NWDAF into consideration for adjustment of UE mobility related network parameters to solve the abnormal risk.

The Network Exposure Function (NEF):

- supports forwarding UE mobility information from NWDAF to the AF when it is untrusted;

- supports forwarding UE communication information from NWDAF to the AF when it is untrusted;

- supports forwarding expected UE behavioural information (UE mobility and/or UE communication) from NWDAF to the AF when it is untrusted;

- supports forwarding abnormal behaviour information from NWDAF to the AF when it is untrusted;

- supports forwarding user data congestion information from NWDAF to the AF when it is untrusted;

- supports forwarding network performance information from NWDAF to the AF when it is untrusted;

- supports forwarding QoS Sustainability information from NWDAF to the AF when it is untrusted.

The Unified Data Management (UDM):

- supports taking expected UE behaviour information (UE mobility and/or UE communication) from NWDAF into consideration for monitoring UE behaviour.

The Application Function (AF):

- supports receiving UE mobility information from NWDAF or via the NEF;

- supports receiving UE communication information from NWDAF or via the NEF;

- supports receiving expected UE behavioural information (UE mobility and/or UE communication) from NWDAF or via the NEF;

- supports receiving abnormal behaviour information from NWDAF or via the NEF;

- supports receiving user data congestion information from NWDAF or via the NEF;

- supports receiving network performance information from NWDAF or via the NEF;

- supports receiving QoS Sustainability information from NWDAF or via the NEF.

The Operation, Administration, and Maintenance (OAM):

- supports receiving observed service experience from NWDAF;

- supports receiving NF load information from NWDAF;

- supports receiving network performance information from NWDAF;

- supports receiving UE mobility information from NWDAF;

- supports receiving UE communication information from NWDAF;

- supports receiving expected UE behaviour information (UE mobility and/or UE communication) from NWDAF;

- supports receiving abnormal UE behaviour information from NWDAF.

The Network Data Analytics Function (NWDAF):

- supports receiving information for all types of network data analytics from NWDAF.

- supports receiving context information related to analytics subscriptions from NWDAF.

\* \* \* \* Next change \* \* \* \*

#### 4.3.2.1 Introduction

Table 4.3.2.1-1: Operations of the Nnwdaf\_AnalyticsInfo Service

| Service operation name | Description | Initiated by |
| --- | --- | --- |
| Nnwdaf\_AnalyticsInfo\_Request | This service operation is used by an NF to request and get specific analytics from NWDAF. | NF consumer (PCF, NSSF, AMF, SMF, NEF, UDM, AF, OAM, NWDAF) |
| Nnwdaf\_AnalyticsInfo\_ContextTransfer | This service operation is used by an NF to request and get context information related to analytics subscriptions from NWDAF. | NF consumer (NWDAF) |

\* \* \* \* End of changes \* \* \* \*