**3GPP TSG-CT WG3 Meeting #112e C3-205383**

**E-Meeting, 4th – 13th November 2020 (Revision of C3-205324)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.520** | **CR** | **0239** | **rev** | **1** | **Current version:** | **16.5.0** |  |
|  | | | | | | | | |
| *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** |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | | | | | |
| ***Title:*** | Updates CEF as NWDAF consumer of Nnwdaf\_EventsSubscription service | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Huawei | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNA | | | | |  | ***Date:*** | | | 2020-10-18 |
|  |  | | | |  | |  | | |  |
| ***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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17)  Rel-18 (Release 18)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | LS S5-204593 informed that CEF (Charging Enablement Function) is specified as a NF that consumes NWDAF services, and S2-2008015 added CEF as new consumer of NWDAF services, and also indicated how CEF consumes Nnwdaf services and which Analytics information is relevant as defined in TS 28.201, in which the Nnwdaf\_AnalyticsSubscription service is described as a service consumed by CEF. Hence CEF as new consumer to NWDAF shall be updated in this specification for Nnwdaf\_EventsSubscription service. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Updates CEF as NWDAF consumer of Nnwdaf\_EventsSubscription service and adding TS 28.201 as reference. Only S-NSSAI identified network slice load level information and/or network slice Service Experience can be subscribed by/notify to CEF. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Not aligned with TS 23.288 and TS 28.201, Not supporting CEF as NWDAF service consumer. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 3.2, 4.1, 4.2.1.2, 4.2.1.3.2, 4.2.2.1, 5.1.6.2.33 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 23.288 CR #0188 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR does not impact the OpenAPI files. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

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

## 3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

5QI 5G QoS Identifier

AF Application Function

AMF Access and Mobility Management Function

API Application Programming Interface

CEF Charging Enablement Function

DNN Data Network Name

GFBR Guaranteed Flow Bit Rate

HTTP Hypertext Transfer Protocol

JSON JavaScript Object Notation

NEF Network Exposure Function

NF Network Function

NRF Network Repository Function

NSSF Network Slice Selection Function

NWDAF Network Data Analytics Function

OAM Operation, Administration, and Maintenance

PCF Policy Control Function

SUPI Subscription Permanent Identifier

S-NSSAI Single Network Slice Selection Assistance Information

SMF Session Management Function

UDM Unified Data Management

UPF User Plane Function

URI Uniform Resource Identifier

UTC Universal Time Coordinated

\*\*\* 2nd Change \*\*\*

## 4.1 Introduction

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

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

The following services are specified for NWDAF:

Table 4.1-1: Services provided by NWDAF

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Service Name | Description | Service Operations | Operation  Semantics | Example Consumer(s) |
| Nnwdaf\_EventsSubscription  (NOTE) | This service enables the NF service consumers to subscribe/unsubscribe the notification for different analytics information from the NWDAF. | Subscribe | Subscribe / Notify | PCF, NSSF, AMF, SMF, NEF, UDM, AF, OAM, CEF |
| Unsubscribe |
| Notify |
| Nnwdaf\_AnalyticsInfo | This service enables the NF service consumers to request and get specific analytics from NWDAF. | Request | Request / Response | PCF, NSSF, AMF, SMF, NEF, UDM, AF, OAM |
| NOTE: The service corresponds to the Nnwdaf\_AnalyticsSubscription service as 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 |

\*\*\* 3rd Change \*\*\*

#### 4.2.1.2 Service Architecture

The 5G System Architecture is defined in 3GPP TS 23.501 [2]. The Network Data Analytics Exposure architecture is defined in 3GPP TS 23.288 [17]. The Policy and Charging related 5G architecture is also described in 3GPP TS 23.503 [4] and 3GPP TS 29.513 [5].

The Nnwdaf\_EventsSubscription service is part of the Nnwdaf service-based interface exhibited by the Network Data Analytics Function (NWDAF).

Known consumers of the Nnwdaf\_EventsSubscription service are:

- Policy Control Function (PCF)

- Network Slice Selection Function (NSSF)

- Access and Mobility Management Function (AMF)

- Session Management Function (SMF)

- Network Exposure Function (NEF)

- Unified Data Management (UDM)

- Application Function (AF)

- Operation, Administration, and Maintenance (OAM)

- Charging Enablement Function (CEF)

The PCF accesses the Nnwdaf\_EventsSubscription service at the NWDAF via the N23 Reference point. The NSSF accesses the Nnwdaf\_EventsSubscription service at the NWDAF via the N34 Reference point.



Figure 4.2.1.2-1: Reference Architecture for the Nnwdaf\_EventsSubscription Service; SBI representation



Figure 4.2.1.2-2: Reference Architecture for the Nnwdaf\_EventsSubscription Service: reference point representation

\*\*\* 4th Change \*\*\*

##### 4.2.1.3.2 NF Service Consumers

The Policy Control Function (PCF):

- supports (un)subscription to the notification of analytics information for slice load level information from the NWDAF;

- supports (un)subscription to the notification of analytics information for service experience related network data from the NWDAF;

- supports (un)subscription to the notification of analytics information for network performance from the NWDAF;

- supports (un)subscription to the notification of analytics information for abnormal UE behaviour from the NWDAF;

- supports (un)subscription to the notification of analytics information for QoS sustainability from 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 (un)subscription to the notification of analytics information for slice load level information from NWDAF to determine slice selection.

The Access and Mobility Management Function (AMF):

- supports (un)subscription to the notification of analytics information for SMF load information from NWDAF to determine SMF selection;

- supports (un)subscription to the notification of analytics information for expected UE behavioural information (UE mobility and/or UE communication) from NWDAF to monitor UE behaviour;

- supports (un)subscription to the notification of analytics information for abnormal UE behaviour information from NWDAF to determine adjustment of UE mobility related network parameters to solve the abnormal risk.

The Session Management Function (SMF):

- supports (un)subscription to the notification of analytics information for UPF load information from NWDAF to determine UPF selection;

- supports (un)subscription to the notification of analytics information for expected UE behavioural information (UE mobility and/or UE communication) from NWDAF to monitor UE behaviour;

- supports (un)subscription to the notification of analytics information for abnormal UE behaviour information from NWDAF to determine adjustment of UE communicationrelated 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 Charging Enablement Function (CEF):

- supports (un)subscription to the notification of analytics information for slice load level information from the NWDAF;

- supports (un)subscription to the notification of analytics information for service experience statistics information from the NWDAF.

\*\*\* 5th Change \*\*\*

#### 4.2.2.1 Introduction

Table 4.2.2.1-1: Operations of the Nnwdaf\_EventsSubscription Service

| Service operation name | Description | Initiated by |
| --- | --- | --- |
| Nnwdaf\_EventsSubscription\_Subscribe | This service operation is used by an NF to subscribe or update subscription for event notifications of the analytic information.  One-time, periodic notification or notification upon event detected can be subscribed. | NF consumer (PCF, NSSF, AMF, SMF, NEF, UDM, AF, OAM, CEF) |
| Nnwdaf\_EventsSubscription\_UnSubscribe | This service operation is used by an NF to unsubscribe from event notifications. | NF consumer (PCF, NSSF, AMF, SMF, NEF, UDM, AF, OAM, CEF) |
| Nnwdaf\_EventsSubscription\_Notify | This service operation is used by an NWDAF to notify NF consumers about subscribed events. | NWDAF |

\*\*\* 6th Change \*\*\*

##### 5.1.6.2.33 Type NsiIdInfo

Table 5.1.6.2.33-1: Definition of type NsiIdInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| snssai | Snssai | M | 1 | Identification of network slice to which the subscription for event notification procedure applies. |  |
| nsiIds | array(NsiId) | O | 1..N | Identification of network slice instance(s) associated with the subscribed S-NSSAI identified by the "snssai" attribute.  May be included when subscribed event is "NSI\_LOAD\_LEVEL" or  "SERVICE\_EXPERIENCE".  (NOTE) |  |
| NOTE: This attribute is not applicable when the NF service consumer is CEF. | | | | | |

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