**3GPP TSG CT WG3 Meeting #138 *C3-246130r2***

**Orlando, U.S; 18th – 22nd November 2024**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **29.520** | **CR** | **0969** | **rev** | **1** | **Current version:** | **19.0.0** |  |
|  | | | | | | | | |
| *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:*** | Adding ADRF as a consumer of Nnwdaf\_EventsSubscription and Nnwdaf\_AnalyticsInfo Services | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | ZTE | | | | | | | | | |
| ***Source to TSG:*** | CT3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNetAE19 | | | | |  | ***Date:*** | | | 2024-11-11 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | Rel-19 |
|  | *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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | According to the reply LS S2-2411139 and agreed CR S2-2410871, ADRF is the consumer of Nnwdaf\_EventsSubscription and Nnwdaf\_AnalyticsInfo Services. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Add ADRF as a consumer of Nnwdaf\_EventsSubscription and Nnwdaf\_AnalyticsInfo Services. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Non compliant with stage-2 requirements. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 4.1, 4.2.1.2, 4.2.1.3.2, 4.2.2.1, 4.3.1.2, 4.3.1.3.2, 4.3.2.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS/TR 23.288.. CR 1203 | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | | This CR does not have any impact in the OpenAPI specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

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

## 4.1 Introduction

The Nnwdaf services are used by the NWDAF to provide specific analytics information and ML models.

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 | Operation  Semantics | | Example Consumer(s) |
| Nnwdaf\_EventsSubscription  (NOTE 1) | This service enables the NF service consumers to subscribe to/unsubscribe from notifications for different analytics information from the NWDAF. It also enables the transfer of subscriptions between NWDAFs | Subscribe | Subscribe / Notify | | PCF, NSSF, AMF, SMF, NEF, AF, LMF, OAM, CEF, NWDAF, DCCF, ADRF |
| Unsubscribe |
| Notify |
| Transfer | Request / Response | | NWDAF |
| 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, AF, LMF, OAM, NWDAF, DCCF, ADRF |
| 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  (NOTE 2) | 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 |
| Nnwdaf\_MLModelTraining  (NOTE 3) | This service enables the NF service consumers to subscribe to/unsubscribe/modify from notifications for a ML model training. | Subscribe | Subscribe / Notify | | NWDAF |
| Unsubscribe |
| Notify |
| Nnwdaf\_MLModelMonitor | This service enables the NF service consumer to subscribe/unsubscribe for ML model accuracy, provide Analytics feedback information for the analytics generated by an NWDAF and enable the NWDAF containing AnLF registers the use and monitoring capability for an ML model into the model provider NWDAF | Subscribe | | Subscribe / Notify | NWDAF |
| Unsubscribe | |
| Notify | |
| Register | | Request / Response |
| Deregister | |
| Nnwdaf\_RoamingData | This service enables the consumer to subscribe/unsubscribe for input data related to roaming UE(s) for NWDAF analytics. | Subscribe | | Subscribe / Notify | H-RE-NWDAF,  V-RE-NWDAF |
| Unsubscribe | |
| Notify | |
| Nnwdaf\_RoamingAnalytics | This service enables the NF service consumers to subscribe (or modify subscriptions) to and unsubscribe from notifications for network data analytics related to roaming UE(s). | Subscribe (NOTE 4) | | Subscribe / Notify | H-RE-NWDAF,  V-RE-NWDAF |
| Unsubscribe | |
| Notify | |
| NOTE 1: This service corresponds to the Nnwdaf\_AnalyticsSubscription service defined in 3GPP TS 23.288 [17].  NOTE 2: This service implements also the Nnwdaf\_MLModelInfo service as specified in 3GPP TS 23.288 [17] by using immediate and one-time reporting requirement.  NOTE 3: This service implements also the Nnwdaf\_MLModelTrainingInfo service as specified in 3GPP TS 23.288 [17] by using immediate and one-time reporting requirement.  NOTE 4: The Nnwdaf\_RoamingAnalytics\_Subscribe service operation implements also the Nnwdaf\_RoamingAnalytics\_Request service operation specified in 3GPP TS 23.288 [17] by using immediate and one-time reporting requirement. | | | | | |

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 |
| Nnwdaf\_MLModelTraining | 5.5 | NWDAF ML Model Training Service | TS29520\_Nnwdaf\_MLModelTraining.yaml | nnwdaf-mlmodeltraining | A.6 |
| Nnwdaf\_MLModelMonitor | 5.6 | NWDAF ML model monitoring Service | TS29520\_Nnwdaf\_MLModelMonitoring.yaml | nnwdaf-mlmodelmonitor | A.7 |
| Nnwdaf\_RoamingData | 5.7 | NWDAF Roaming Data Service | TS29520\_Nnwdaf\_RoamingData.yaml | nnwdaf-roamingdata | A.8 |
| Nnwdaf\_RoamingAnalytics | 5.8 | NWDAF Roaming Analytics service | TS29520\_Nnwdaf\_RoamingAnalytics.yaml | nnwdaf-roaminganalytics | A.9 |

\*\*\* 2nd 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 Network Data Analytics signalling flows are defined in 3GPP TS 29.552 [25], 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)

- Application Function (AF)

- Location Management Function (LMF)

- Operation, Administration, and Maintenance (OAM)

- Charging Enablement Function (CEF)

- Network Data Analytics Function (NWDAF)

- Data Collection Coordination Function (DCCF)

- Analytics Data Repository Function (ADRF)

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

NOTE: When the NEF subscribes the PFD Determination Analytics to the NWDAF, the NEF needs to support PFDF function as NEF (PFDF).

\*\*\* 3rd 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 UE mobility from the NWDAF;

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

- supports (un)subscription to the notification of analytics information for user data congestion from the NWDAF;

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

- supports (un)subscription to the notification of analytics information for session management congestion control experience from the NWDAF;

- supports (un)subscription to the notification of analytics information for redundant transmission experience from the NWDAF;

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

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

- supports (un)subscription to the notification of analytics information for PDU Session traffic from the NWDAF; and

- supports taking one or more above input from the 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 specification.

The Network Slice Selection Function (NSSF):

- supports (un)subscription to the notification of analytics information for slice load level information or network slice instance load level information from the NWDAF to determine slice selection;

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

- supports (un)subscription to the notification of analytics information for dispersion at the slice from the NWDAF.

The Access and Mobility Management Function (AMF):

- 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 SMF load information from the 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 the NWDAF to monitor UE behaviour;

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

- supports (un)subscription to the notification of analytics information for dispersion at the slice from the NWDAF.

The Session Management Function (SMF):

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

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

- supports (un)subscription to the notification of analytics information for Session Management Congestion Control Experience from the NWDAF;

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

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

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

- 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 redundant transmission experience from the NWDAF to consider whether redundant transmission shall be performed, or (if it had been activated) shall be stopped; and

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

The Network Exposure Function (NEF):

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

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

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

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

- supports (un)subscription to the notification of analytics information for user data congestion 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 QoS Sustainability from the NWDAF;

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

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

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

- supports (un)subscription to the notification of analytics information for Observed Service Experience from NWDAF;

- with PFDF function supports (un)subscription to the notification of analytics information for NWDAF assisted PFD Determination from the NWDAF;

- supports (un)subscription to the notification of analytics information for E2E data volume transfer time from NWDAF;

- supports (un)subscription to the notification of analytics information for Relative Proximity from NWDAF; and

- supports (un)subscription to the notification of analytics information for movement behaviour from NWDAF.

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 the NWDAF or via the NEF;

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

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

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

- supports receiving Dispersion information from the NWDAF or via the NEF;

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

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

- supports receiving Observed Service Experience information from NWDAF or via the NEF;

- supports receiving E2E data volume transfer time from NWDAF or via the NEF;

- supports receiving Movement Behaviour information from NWDAF or via the NEF; and

- supports receiving Relative Proximity information from NWDAF or via the NEF.

The Operation, Administration, and Maintenance (OAM):

- supports receiving slice load level information from the NWDAF;

- supports receiving observed service experience from the NWDAF;

- supports receiving NF load information from the NWDAF;

- supports receiving network performance information from the NWDAF;

- supports receiving UE mobility information from the NWDAF;

- supports receiving UE communication information from the NWDAF;

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

- supports receiving abnormal UE behaviour information from the NWDAF.

The Charging Enablement Function (CEF):

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

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

The Location Management Function (LMF):

- supports (un)subscription to the notification of analytics information for location accuracy analytics from the NWDAF.

The Network Data Analytics Function (NWDAF):

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

- supports requesting the transfer of subscriptions to another NWDAF.

The Data Collection Coordination Function (DCCF):

- supports (un)subscription to the notification of analytics information for all types of network analytics from the NWDAF.

The Analytics Data Repository Function (ADRF):

- supports (un)subscription to the notification of analytics information for all types of network analytics from the NWDAF.

\*\*\* 4th 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 analytics information.  One-time, periodic notification or notification upon event detected can be subscribed. | NF service consumer (PCF, NSSF, AMF, SMF, NEF, AF, LMF, OAM, CEF, NWDAF, DCCF, ADRF) |
| Nnwdaf\_EventsSubscription\_Unsubscribe | This service operation is used by an NF to unsubscribe from event notifications. | NF service consumer (PCF, NSSF, AMF, SMF, NEF, AF, LMF, OAM, CEF, NWDAF, DCCF, ADRF) |
| Nnwdaf\_EventsSubscription\_Notify | This service operation is used by an NWDAF to notify NF service consumers about subscribed events. | NWDAF |
| Nnwdaf\_EventsSubscription\_Transfer | This service operation is used by an NWDAF to request the transfer of subscription(s) for analytics events. | NWDAF |

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

#### 4.3.1.2 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 Network Data Analytics signalling flows are defined in 3GPP TS 29.552 [25], the Policy and Charging related 5G architecture is also described in 3GPP TS 23.503 [4] and 3GPP TS 29.513 [5].

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

Known consumers of the Nnwdaf\_AnalyticsInfo 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)

- Application Function (AF)

- Location Management Function (LMF)

- Operation, Administration, and Maintenance (OAM)

- Network Data Analytics Function (NWDAF)

- Data Collection Coordination Function (DCCF)

- Analytics Data Repository Function (ADRF)

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



Figure 4.3.1.2-1: Reference Architecture for the Nnwdaf\_AnalyticsInfo Service; SBI representation



Figure 4.3.1.2-2: Reference Architecture for the Nnwdaf\_AnalyticsInfo Service: reference point representation

\*\*\* 6th 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 analytics information for UE mobility from the NWDAF;

- supports taking analytics information for UE communication from the NWDAF;

- supports taking analytics information for user data congestion from the NWDAF.

- supports taking analytics information for dispersion from the NWDAF;

- supports taking analytics information for session management congestion control experience from the NWDAF;

- supports taking analytics information for redundant transmission experience from the NWDAF;

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

- supports taking analytics information for PDU Session traffic from the NWDAF; and

- 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 specification.

The Network Slice Selection Function (NSSF):

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

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

- supports taking analytics information for dispersion at the slice from the NWDAF.

The Access and Mobility Management Function (AMF):

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

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

- supports taking abnormal UE behaviour information from the 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; and

- supports taking analytics information for dispersion at the slice from the NWDAF.

The Session Management Function (SMF):

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

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

- supports taking UE mobility information from the NWDAF into consideration for UPF selection;

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

- supports taking analytics information for SM congestion control experience from the NWDAF into consideration for determining back-off timer provided to UE;

- supports taking analytics information for slice load level or network slice instance load level from the NWDAF into consideration to determine slice selection;

- supports taking analytics information for service experience from the NWDAF into consideration to (re)select UP paths;

- supports taking analytics information for redundant transmission experience from the NWDAF to consider whether redundant transmission shall be performed, or (if it had been activated) shall be stopped; and

- supports taking analytics information for DN performance from the NWDAF into consideration for user plane performance.

The Network Exposure Function (NEF):

- supports taking analytics information for UE mobility from the NWDAF;

- supports taking analytics information for UE communication from the NWDAF;

- supports taking analytics information for expected UE behavioural (UE mobility and/or UE communication) from the NWDAF;

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

- supports taking analytics information for user data congestion from the NWDAF;

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

- supports taking analytics information for QoS Sustainability from the NWDAF;

- supports taking analytics information for Dispersion from the NWDAF;

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

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

- supports taking analytics information for Observed Service Experience from NWDAF;

- supports taking analytics information for E2E data volume transfer time from NWDAF;

- supports taking analytics information for Relative Proximity from NWDAF; and

- supports taking analytics information for movement behaviour from NWDAF.

The Application Function (AF):

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

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

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

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

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

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

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

- supports receiving Dispersion information from the NWDAF or via the NEF;

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

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

- supports receiving Observed Service Experience information from NWDAF or via the NEF;

- supports receiving E2E data volume transfer time from NWDAF or via the NEF.

- supports receiving Movement Behaviour information from NWDAF or via the NEF. and

- supports receiving Relative Proximity information from NWDAF or via the NEF.

The Location Management Function (LMF):

- supports taking Location Accuracy analytics from the NWDAF into consideration as assistance for location services.

The Operation, Administration, and Maintenance (OAM):

- supports receiving slice load level information from the NWDAF;

- supports receiving observed service experience from the NWDAF;

- supports receiving NF load information from the NWDAF;

- supports receiving network performance information from the NWDAF;

- supports receiving UE mobility information from the NWDAF;

- supports receiving UE communication information from the NWDAF;

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

- supports receiving abnormal UE behaviour information from the NWDAF.

The Network Data Analytics Function (NWDAF):

- supports receiving information for all types of network data analytics from the NWDAF; and

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

The Data Collection Coordination Function (DCCF):

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

The Analytics Data Repository Function (ADRF):

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

\*\*\* 7th 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, AF, LMF, OAM, NWDAF, DCCF, ADRF) |
| 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 \*\*\*