**3GPP TSG CT WG3 Meeting #137 *C3-245374***

**Hefei, CN, 14 - 18 October, 2024 *(Revision of C3-245304)***

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  |  | **CR** |  | **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:*** | Various corrections on Nnef service | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** |  | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***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 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:*** | | The following issues have been identified in the current specification:   1. Simplified the description in some general clauses and removed the redundant descriptions. 2. "Can" should be avoided in the normative text. 3. Correct the reference number for TS 29.504. 4. Additional editorial and format issues. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | Fix the above issue. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | Incorrect specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | Foreword, 4.2.1.1, 4.2.2.2.1, 4.4.1.3.1, 4.4.2.2.2, 4.4.2.2.3, 4.5.2.2.2, 4.5.2.2.3, 4.6.1.3.1, 4.6.1.3.2, 4.6.2.2.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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 does not impact on the OpenAPI file. | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

**Additional discussion(if needed):**

**Proposed changes:**

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

# Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

The contents of the present document are subject to continuing work within the TSG and may change following formal TSG approval. Should the TSG modify the contents of the present document, it will be re-released by the TSG with an identifying change of release date and an increase in version number as follows:

Version x.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater indicates TSG approved document under change control.

y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.

z the third digit is incremented when editorial only changes have been incorporated in the document.

In the present document, certain modal verbs have the following meanings:

**shall** indicates a mandatory requirement to do something

**shall not** indicates an interdiction (prohibition) to do something

NOTE 1: The constructions "shall" and "shall not" are confined to the context of normative provisions, and do not appear in Technical Reports.

NOTE 2: The constructions "must" and "must not" are not used as substitutes for "shall" and "shall not". Their use is avoided insofar as possible, and they are not used in a normative context except in a direct citation from an external, referenced, non-3GPP document, or so as to maintain continuity of style when extending or modifying the provisions of such a referenced document.

**should** indicates a recommendation to do something

**should not** indicates a recommendation not to do something

**may** indicates permission to do something

**need not** indicates permission not to do something

NOTE 3: The construction "may not" is ambiguous and is not used in normative elements. The unambiguous constructions "might not" or "shall not" are used instead, depending upon the meaning intended.

**can** indicates that something is possible

**cannot** indicates that something is impossible

NOTE 4: The constructions "can" and "cannot" shall not to be used as substitutes for "may" and "need not".

**will** indicates that something is certain or expected to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**will not** indicates that something is certain or expected not to happen as a result of action taken by an agency the behaviour of which is outside the scope of the present document

**might** indicates a likelihood that something will happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

**might not** indicates a likelihood that something will not happen as a result of action taken by some agency the behaviour of which is outside the scope of the present document

In addition:

**is** (or any other verb in the indicative mood) indicates a statement of fact

**is not** (or any other negative verb in the indicative mood) indicates a statement of fact

NOTE 5: The constructions "is" and "is not" do not indicate requirements.

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

#### 4.2.1.1 Overview

The Nnef\_EventExposure service, as defined in 3GPP TS 23.502 [3], is provided by the Network Exposure Function (NEF). When the UE Application data is collected via the Data Collection AF, the Application Function Exposure Service, as defined in 3GPP TS 26.531 [24], 3GPP TS 26.501 [25] and 3GPP TS 26.512 [26], is provided by the Data Collection AF instantiated in the 5GMS AF for the Event Consumer AF instantiated in the 5GMS ASP.

This service:

- allows NF service consumers to subscribe, modify and unsubscribe the application events reporting; and

- notifies NF service consumers with a corresponding subscription about observed events at the NEF.

The types of observed events applicable for the NEF include:

AF application events exposed by an AF:

- Service experience;

- UE mobility;

- UE communication;

- Exceptions;

- User Data Congestion;

- Dispersion;

- Performance Data information;

- Collective Behaviour information;

- GNSS Assistance Data information; and

- Data volume transfer time information.

UE application events exposed via the Data Collection AF:

- Media Streaming QoE metrics;

- Media Streaming Consumption reports;

- Media Streaming Network Assistance invocation;

- Media Streaming Dynamic Policy invocation; and

- Media Streaming access activity.

The target of the event reporting may include one or more UE(s), a group of UEs or any UE (i.e. all UEs). When an event to which the NF service consumer has subscribed occurs, the NEF reports the requested information to the NF service consumer based on the event reporting information definition.

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

##### 4.2.2.2.1 General

This service operation is used by the NF service consumer to subscribe the notifications on specified event(s) or modify an existing subscription.

The following are the types of events for which a subscription to notify the NWDAF, the DCCF, or the MFAF as the NF service consumer:

- Service experience;

- UE mobility;

- UE communication;

- Exceptions;

- User Data Congestion;

- Dispersion;

- Performance Data information; and

- Collective Behaviour information.

The following are the types of events for which a subscription to notify the NWDAF, DCCF, MFAF, or Event Consumer AF as the NF service consumer:

- Media Streaming QoE metrics.

The following are the types of events for which a subscription to notify the LMF as the NF service consumer:

- GNSS Assistance Data information.

The following are the types of events for which a subscription to notify the Event Consumer AF as the NF service consumer:

- Media Streaming Consumption reports;

- Media Streaming Network Assistance invocation;

- Media Streaming Dynamic Policy invocation; and

- Media Streaming access activity.

The following procedures using the Nnef\_EventExposure\_Subscribe service operation are supported:

- creating a new subscription;

- modifying an existing subscription.

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

##### 4.4.1.3.1 Network Exposure Function (NEF)

The Network Exposure Function (NEF) allows the NF service consumer to subscribe to and unsubscribe for the Traffic Influence Data from AF.

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

##### 4.4.2.2.2 Creating a new subscription

Figure 4.4.2.2.2-1 illustrates the creation of a Individual Traffic Influence Data Subscription.



Figure 4.4.2.2.2-1: Creation of a subscription

In order to subscribe to Traffic Influence Data, the NF service consumer (e.g., SMF) shall send a Nnef\_TrafficInfluenceData\_Subscribe request using the HTTP POST method to the NEF with "{apiRoot}/nnef-traffic-influence-data/<apiVersion>/subscriptions" as request URI as shown in step 1 of figure 4.4.2.2.2-1. The HTTP POST message shall include TrafficInfluDataSub data structure as request body. The TrafficInfluDataSub data structure shall include:

- the notification URI in the "notifUri" attribute;

- the notification correlation identifier in the "notifCorrId" attribute;

- the identifications of DNN in the "dnns" attribute and/or the identifications of network slice in the "snssais" attribute;

and may include:

- the identification(s) of target UE(s) in the "supis" attribute;

- the any UE indication in the "anyUe" attribute;

- the identification(s) of the HPLMN in the "hplmnId" attribute;

- the UE address(es) either in the "ipv4Addrs" attribute or in the "ipv6Addrs" attribute;

- the reporting requirements of the subscription in "rptInfo" attribute.

Upon receipt of the HTTP request from the NF service consumers (e.g., SMF), the NEF shall interact with the UDR by invoking the Nudr\_DataRepository service as described in 3GPP TS 29.504 [32] to retrieve and subscribe to the Traffic Influence Data in the application data in the UDR.

After receiving a successful response from the UDR, the NEF shall create a new subscription and assign a subscription identifier for the "Individual Traffic Influence Data Subscription" resource. Then the NEF shall send an HTTP "201 Created" response with TrafficInfluDataSub data structure as response body and a Location header field containing the URI of the created individual subscription resource to the NF service consumer.

If the immediate report indication is included in the subscription request, the NEF shall include the currently available Traffic Influence Data in the response body.

If errors occur when processing the HTTP POST request or receiving an error code from the UDR, the NEF shall send an HTTP error response as specified in clause 5.3.7.

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

##### 4.4.2.2.3 Modifying an existing subscription

Figure 4.4.2.2.3-1 illustrates the modification of an existing subscription.



Figure 4.4.2.2.3-1: Modification of an existing subscription

To modify an existing subscription to event notifications, the NF service consumer shall send an HTTP PUT request with: "{apiRoot}/nnef-traffic-influence-data/<apiVersion>/subscriptions/{subscriptionId}" as request URI, as shown in step 1 of figure 4.4.2.2.3-1, where "{subscriptionId}" is the subscription ID of the existing subscription. The TrafficInfluDataSub data structure is included as request body as described in clause 4.4.2.2.2.

Upon successful reception of an HTTP PUT request with: "{apiRoot}/nnef-traffic-influence-data/<apiVersion>/subscriptions/{subscriptionId}" as request URI and TrafficInfluDataSub data structure as request body, the NEF shall interact with the UDR by invoking the Nudr\_DataRepository service as described in 3GPP TS 29.504 [32] to retrieve and subscribe to the Traffic Influence Data in the application data in the UDR.

After receiving a successful response from the UDR, the NEF shall:

- send HTTP "200 OK" response (as shown in figure 4.4.2.2.3-1, step 2a) with a response body containing a representation of the updated subscription in the TrafficInfluDataSub data type; or

- send HTTP "204 No Content" response (as shown in figure 4.4.2.2.3-1, step 2b).

If the immediate report indication is included in the subscription request, the NEF shall include the currently available Traffic Influence Data in the response body.

If the received HTTP PUT request needs to be redirected, the NEF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [4].

If errors occur when processing the HTTP PUT request or receiving an error code from the UDR, the NEF shall send an HTTP error response as specified in clause 5.3.7.

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

##### 4.5.2.2.2 Creating a new subscription

Figure 4.5.2.2.2-1 illustrates the creation of a Individual ECS Address Configuration Information Subscription.



Figure 4.5.2.2.2-1: Creation of a subscription

In order to subscribe to ECS Address Configuration Information, the NF service consumers shall send an Nnef\_ECSAddress\_Subscribe request using the HTTP POST method to the NEF with "{apiRoot}/nnef-ecs-addr-cfg-info/<apiVersion>/subscriptions" as request URI as shown in step 1 of figure 4.5.2.2.2-1. The HTTP POST message shall include EcsAddrCfgInfoSub data structure as request body. The EcsAddrCfgInfoSub data structure shall include:

- the notification URI in the "notifUri" attribute;

- the notification correlation identifier in the "notifCorrId" attribute;

and may include:

- the identification(s) of DNN in "dnns" attribute;

- the identification(s) of network slice in "snssais" attribute;

- an indicator to immediately report the currently available ECS Address Configuration Information in "immRepInd" attribute;

Upon receipt of the HTTP request from the NF service consumers, the NEF shall interact with the UDR by invoking the Nudr\_DataRepository service as described in 3GPP TS 29.504 [32] to retrieve and subscribe the ECS Address Configuration Information in the application data in the UDR.

After receiving a successful response from the UDR, the NEF shall create a new subscription and assign a subscription identifier for the "Individual ECS Address Configuration Information Subscription" resource. Then the NEF shall send an HTTP "201 Created" response with EcsAddrCfgInfoSub data structure as response body and a Location header field containing the URI of the created individual subscription resource to the NF service consumer.

If the immediate report indication is included in the subscription request, the NEF shall include the currently available ECS Address Configuration Information in "immReports" attribute in the response body.

If errors occur when processing the HTTP POST request or receiving an error code from the UDR, the NEF shall send an HTTP error response as specified in clause 5.47.

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

##### 4.5.2.2.3 Modifying an existing subscription

Figure 4.5.2.2.3-1 illustrates the modification of an existing subscription.



Figure 4.5.2.2.3-1: Modification of an existing subscription

To modify an existing subscription to event notifications, the NF service consumer shall send an HTTP PUT/PATCH request with: "{apiRoot}/nnef-ecs-addr-cfg-info/<apiVersion>/subscriptions/{subscriptionId}" as request URI, as shown in step 1 of figure 4.5.2.2.3-1, where "{subscriptionId}" is the subscription ID of the existing subscription. The EcsAddrCfgInfoSub data structure is included as PUT request body as described in clause 4.5.2.2.2 or the EcsAddrCfgInfoSubPatch data structure is included as PATCH request body as defined in clause 5.4.6.2.4.

Upon successful reception of an HTTP PUT/PATCH request with: "{apiRoot}/nnef-ecs-addr-cfg-info/<apiVersion>/subscriptions/{subscriptionId}" as request URI and EcsAddrCfgInfoSub/EcsAddrCfgInfoSubPatch data structure as request body, the NEF shall interact with the UDR by invoking the Nudr\_DataRepository service as described in 3GPP TS 29.504 [32] to retrieve and subscribe the ECS Address Configuration Information in the application data in the UDR.

After receiving a successful response from the UDR, the NEF shall:

- send HTTP "200 OK" response (as shown in figure 4.5.2.2.3-1, step 2a) with a response body containing a representation of the updated subscription in the EcsAddrCfgInfoSub data type; or

- send HTTP "204 No Content" response (as shown in figure 4.5.2.2.3-1, step 2b).

If the immediate report indication is included in the subscription request, the NEF shall include the current available ECS Address Configuration Information in the response body.

If the received HTTP PUT/PATCH request needs to be redirected, the NEF shall send an HTTP redirect response as specified in clause 6.10.9 of 3GPP TS 29.500 [4].

If errors occur when processing the HTTP PUT/PATCH request or receiving an error code from the UDR, the NEF shall send an HTTP error response as specified in clause 5.4.7.

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

##### 4.6.1.3.1 Network Exposure Function (NEF)

The Network Exposure Function (NEF) allows the NF service consumer (e.g. NWDAF) to subscribe and unsubscribe the DNAI Mapping information and notify the update of the DNAI Mapping information.

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

##### 4.6.1.3.2 NF Service Consumers

The known NF service consumers are as follows:

The Network Data Analytics Function (NWDAF):

- supports (un)subscribing to notifications of the DNAI Mapping information from the NEF;

- supports receiving the notifications of update of the subscribed DNAI Mapping Information from the NEF.

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

##### 4.6.2.2.2 Creating a new subscription for notification of DNAI Mapping Information

Figure 4.6.2.2.2-1 illustrates the creation of a Individual DNAI Mapping Information Subscription.



Figure 4.6.2.2.2-1: Creation of a subscription

In order to subscribe to DNAI Mapping Information, the NF service consumer shall send an Nnef\_DNAIMapping\_Subscribe request using the HTTP POST method to the NEF with "{apiRoot}/nnef-dnai-mapping/<apiVersion>/subscriptions" as request URI as shown in step 1 of figure 4.6.2.2.2-1. The HTTP POST message shall include DnaiMapSub data structure as request body. The contents of the DnaiMapSub data structure are as described in clause 4.4.34.2 of 3GPP TS 29.522 [15].

Upon receipt of the corresponding HTTP POST message, the NEF shall interact with the UDR by invoking the Nudr\_DataRepository service as described in 3GPP TS 29.504 [32], if the NEF receives an error response from the UDR, the NEF shall not create the resource and shall respond to the NF service consumer with a proper error status code. If the NEF received within an error response a "ProblemDetails" data structure with a "cause" attribute indicating an application error, the NEF shall relay this error response to the NF service consumer with a corresponding application error, when applicable.

On successful DNAI Mapping subscription creation, the NEF shall return an HTTP POST response with an HTTP "201 Created" status code to the NF service consumer, including a "Location" header containing the URI of the created "Individual DNAI Mapping Subscription" resource and the response body containing a representation of the created resource within the DnaiMapSub data structure. The contents of the DnaiMapSub data structure in the response are as described for the subscription response in clause 4.4.34.2 of 3GPP TS 29.522 [15].

On failure, the NEF shall take proper error handling actions, as specified in clause 5.5.7, and respond to the NF service consumer with an appropriate error status code.

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