**3GPP TSG-CT WG3 Meeting #135 *C3-243290r2***

**Hyderabad, IN, 27 - 31 May, 2024 (Revision of C3-243290)**

|  |
| --- |
| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
|  |
|  | **29.522** | **CR** | **1205** | **rev** | **4** | **Current version:** | **18.5.0** |  |
|  |
| *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 in Nnef\_UEId Service API |
|  |  |
| ***Source to WG:*** | Ericsson, AT&T |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | TEI18, EDGEAPP |  | ***Date:*** | 2023-03-25 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** |  Rel-18 |
|  | *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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | The Nnef\_UEId Service is currently restricted to only support the retrieval of the AF specific UE Identifier (i.e. a GPSI in the form of an External Identifier). This restriction is not meeting operators’ requirements for supporting the exposure of GPSI in the form of MSISDN to authorized AFs.The corresponding TS 23.501 CR 5011 and TS 23.502 CR 4509 have been approved which require changes to this specification.In SA2#162 meeting, TS 23.502 CR 4805 was endorsed pending with question LS to SA3. SA3#116 corresponding LS C3-243390 (S3-242375) replied that SA3 prefers SA2 does not use the term "trusted" in this context, as there is no unique definition of "trusted" in 3GPP. Thus, SA3 would like to suggest to SA2 that the condition description in clause 4.15.10A of TS 23.502 can be replaced by the following:Depending on operator policy and local regulation, GPSI in MSISDN format may be exposed through the NEF to an authenticated and authorized AF, in which the selected AF is decided by the operator. Depending on operator policy and local regulation, user consent may be required when exposing MSISDN. RNAA defined in clause 6.5.3 of TS 33.122 can be used for user consent.Hence the related stage 2 requirements to be updated accordingly in this CR. |
|  |  |
| ***Summary of change:*** | Extending UE ID retrieval with new feature to support exposure of GPSI in the form of MSISDN by mapping the UE address for authorized AF. |
|  |  |
| ***Consequences if not approved:*** | Not aligned with corresponding stage 2 requirements. |
|  |  |
| ***Clauses affected:*** | 3.2, 4.4.32, 4.4.32.1, 4.4.32.2, 4.4.32.3(new), 5.25.3.1, 5.25.3.2.3(new), 5.25.5.1, 5.25.5.3.4(new), 5.25.5.3.5(new), 5.25.7.3, 6, 7.2, A.23 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 23.502 CR 4805 |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | This CR introduces a backwards compatible feature in the OpenAPI file of the UEId API. |
|  |  |
| ***This CR's revision history:*** | **Rev 3 provides additional update:*** Upon TS 23.502 CR 4805 added user consent mechanism e.g. as defined in Annex V of TS 33.501, the optional user consent management procedure and related application error are added.

**Rev 4 provides additional update:*** Removed "trusted" for the AF.
* Revised user consent related description according to SA3 LS reply.
* Add a new custom operation to get MSISDN.
 |

**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].

A-KID AKMA Key IDentifier

A-TID AKMA Temporary UE IDentifier

A2X Aircraft-to-Everything

AAnF AKMA Anchor Function

ACS Auto-Configuration Server

AI/ML Artificial Intelligence/Machine Learning

AF Application Function

AKMA Authentication and Key Management for Applications

AM Access and Mobility management

ASTI Access Stratum TIme distribution

BAT Burst Arrival Time

BDT Background Data Transfer

CAPIF Common API Framework

CP Communication Pattern

DN Data Network

DNAI DN Access Identifier

DNN Data Network Name

EAS Edge Application Server

ECS Edge Configuration Server

EHE Edge Hosting Environment

FQDN Fully Qualified Domain Name

GMLC Global Mobile Location Centre

GPSI Generic Public Subscription Identifier

IPTV Internet Protocol Television

KAF AKMA Application Key

MBS Multicast/Broadcast Service

MB-SMF Multicast/Broadcast Session Management Function

MCC Mobile Country Code

MNC Mobile Network Code

MO-LR Mobile Originated Location Request

NAT Network Address Translation

NAPT Network Address Port Translation

NEF Network Exposure Function

NSAC Network Slice Admission Control

NSACF Network Slice Admission Control Function

PCF Policy Control Function

PEGC PIN Element with Gateway Capability

PCRF Policy and Charging Rule Function

PDTQ Planned Data Transfer with QoS requirements

PFD Packet Flow Description

PFDF Packet Flow Description Function

PIN Personal IoT Network

REST Representational State Transfer

RNAA Resource owner-aware Northbound API Access

SCEF Service Capability Exposure Function

SFC Service Function Chain

S-NSSAI Single Network Slice Selection Assistance Information

SSM Source Specific IP Multicast address

TAI Traffic Area Identity

TMGI Temporary Mobile Group Identity

TNAP Trusted Network Access Point

TSC Time Sensitive Communication

TSCAI Time Sensitive Communication Assistance Information

TSCTSF Time Sensitive Communication and Time Synchronization Function

UDR Unified Data Repository

UP User Plane

UPF User Plane Function

URSP UE Route Selection Policy

WB Wide Band

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

### 4.4.32 Procedures for UE ID retrieval

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

#### 4.4.32.1 General

The procedures described in the clauses below are used by an AF to request the NEF to provide an AF specific UE ID, as described in clause 4.15.10 and clause 4.15.10A of 3GPP TS 23.502 [2].

UE ID retrieval procedures can be used by an AF to request the NEF to fecth either:

- the AF specific UEID (i.e. GPSI in the form of an External Identifier); or

- GPSI in the form of MSISDN.

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

#### 4.4.32.2 Retrieve AF specific UE ID service operation

In order to retrieve AF specific UE ID information, the AF shall send an HTTP POST request message to the NEF targeting the custom operation URI "{apiRoot}/3gpp-ueid/v1/retrieve", with the request body including the UeIdReq data structure. If the feature "PortNumber" is supported, the port number associated with the UE IP address may be also included in the UeIdReq data structure.

Upon reception of the HTTP POST request message from the AF, the NEF shall check whether the AF is authorized to perform this operation or not:

- if the AF's request for AF specific UE ID retrieval is not authorized, the NEF shall respond to the AF with a "403 Forbidden" status code with the response body including the ProblemDetails data structure containing the "cause" attribute set to the "REQUEST\_NOT\_AUTHORIZED" application error indicating the AF authorisation failure; or

- if the AF's request for AF specific UE ID retrieval is authorized, then if the DNN and/or S-NSSAI information is not available in the request, the NEF shall determine the corresponding DNN and/or S-NSSAI information based on the requesting AF Identifier, and if provided, the MTC Provider Information.

Upon AF authorization success, if the port number associated with the UE IP address is received and based on configuration, the NEF may recognize that the IP address received is different from the actual private UE IP address assigned by 5GC, i.e. the UE is behind a NAT in UPF. If so, the NEF shall discover the UPF implementing NAT functionality for the UE (public) IP address via Nnrf\_NFDiscovery service as defined in 3GPP TS 29.510 [57] and then the NEF shall request UE's (private) IP address and IP domain (if the UE IPv4 address is provided) from the UPF by invoking the Nupf\_GetUEPrivateIPaddrAndIdentifiers\_Get service operation as defined in 3GPP TS 29.564 [61]. If the UPF has the SUPI of the UE, the UPF may directly return the SUPI to the NEF then the NEF shall skip the interaction with the BSF for SUPI retrieval. Otherwise the NEF shall then interact with the BSF using the UE address and IP domain (if the UE IPv4 address is provided), DNN and/or S-NSSAI to retrieve the session binding information of the UE by invoking the Nbsf\_Management\_Discovery service operation, as described in 3GPP TS 29.521 [9].

If the NEF receives an error response from the UPF or BSF, the NEF shall respond to the AF with a proper error status code. If the NEF received from the BSF an error response including a "ProblemDetails" data structure with the "cause" attribute indicating an application error, the NEF shall relay this error response to the AF with a corresponding application error. If no SUPI matching the provided UE information is returned by the BSF, the NEF shall respond to the AF with a "404 Not Found" status code with the response body including a ProblemDetails data structure containing the "cause" attribute set to the "UE\_NOT\_FOUND" application error to indicate that the requested UE address is not found.

Upon successfully receiving the SUPI from either the BSF or UPF, the NEF shall then interact with UDM to retrieve the AF specific UE Identifier using the received SUPI and at least one of the Application Port ID, MTC Provider Information or AF Identifier information by invoking Nudm\_SDM\_Get service, as described in clause 5.2.2.2 of 3GPP TS 29.503 [17]. Upon success, the UDM responds to the NEF with the AF specific UE Identifier represented as an External Identifier for the UE which is uniquely associated with the Application Port ID, MTC provider Information and/or AF Identifier. The NEF shall then respond to the AF with the received information, i.e. the AF specific UE Identifier represented as an External Identifier that was received from the UDM.

If the NEF receives an error response from the UDM, the NEF shall respond to the AF with a proper error status code. If the NEF received from the UDM an error response including a "ProblemDetails" data structure with the "cause" attribute indicating an application error, the NEF shall relay this error response to the AF with a corresponding application error. If the UDM indicates that the requested UE Identifier is not available in the subscription data, the NEF shall respond to the AF with a "404 Not Found" error status code with the response body including a ProblemDetails data structure containing the "cause" attribute set to the "UE\_ID\_NOT\_AVAILABLE" application error to indicate that the AF specific UE ID is not available.

NOTE: The combination of IP address and Port Number can be used by 5GC to derive the UE private IP address assigned by 5GC if the UE is behind a NAT deployed with NAPT within UPF.

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

#### 4.4.32.3 Get MSISDN service operation

If the operator policy and local regulation requires the UE ID exposure in the GPSI format of MSISDN to an authenticated and authorized AF, the AF shall send an HTTP POST request message to the NEF targeting the custom operation URI "{apiRoot}/3gpp-ueid/v1/get-msisdn", with the request body including the MsisdnReq data structure.

Upon reception of the HTTP POST request message from the AF, the NEF shall check whether the AF is authorized to perform this operation or not:

- if the AF's request for MSISDN retrieval is not authorized, the NEF shall respond to the AF with a "403 Forbidden" status code with the response body including the ProblemDetails data structure containing the "cause" attribute set to the "REQUEST\_NOT\_AUTHORIZED" application error indicating the AF authorization failure; or

- if the AF's request for MSISDN retrieval is authorized, then if the DNN and/or S-NSSAI information is not available in the request, the NEF shall determine the corresponding DNN and/or S-NSSAI information based on the requesting AF Identifier, and if provided, the MTC Provider Information.

Upon AF authorization success, if the port number associated with the UE IP address is received and based on configuration, the NEF may recognize that the IP address received is different from the actual private UE IP address assigned by 5GC, i.e. the UE is behind a NAT in UPF. If so, the NEF shall discover the UPF implementing NAT functionality for the UE (public) IP address via Nnrf\_NFDiscovery service as defined in 3GPP TS 29.510 [57] and then the NEF shall request UE's (private) IP address and IP domain (if the UE IPv4 address is provided) from the UPF by invoking the Nupf\_GetUEPrivateIPaddrAndIdentifiers\_Get service operation as defined in 3GPP TS 29.564 [61]. If the UPF has the SUPI of the UE, the UPF may directly return the SUPI to the NEF then the NEF shall skip the interaction with the BSF for SUPI retrieval. Otherwise, the NEF shall then interact with the BSF using the UE address and IP domain (if the UE IPv4 address is provided), DNN and/or S-NSSAI to retrieve the session binding information of the UE by invoking the Nbsf\_Management\_Discovery service operation, as described in 3GPP TS 29.521 [9].

If the NEF receives an error response from the UPF or BSF, the NEF shall respond to the AF with a proper error status code. If the NEF received from the BSF an error response including a "ProblemDetails" data structure with the "cause" attribute indicating an application error, the NEF shall relay this error response to the AF with a corresponding application error. If no SUPI matching the provided UE information is returned by the BSF, the NEF shall respond to the AF with a "404 Not Found" status code with the response body including a ProblemDetails data structure containing the "cause" attribute set to the "UE\_NOT\_FOUND" application error to indicate that the requested UE address is not found.

Upon successfully receiving the SUPI from either the BSF or UPF, the NEF shall proceed as follows:

* If local regulation and operator policy requires user consent for MSISDN retrieval, the NEF shall check user consent for the targeted UE by retrieving the user consent subscription data via one of the following methods depending on whether the optional CAPIF is used (i.e. RNAA use case) or not:
	+ If CAPIF is not used, then NEF shall use the Nudm\_SDM service API of the UDM as specified in clause 5.2.2.2.24 of 3GPP TS 29.503 [17] to check for user consent.
	+ If CAPIF is used, then the RNAA procedure as defined in clause 5.6.2.3.2 of 3GPP TS 29.222 [12] shall be used.
* After checking for user consent (as above), if user consent is not granted for the SUPI received from either the BSF or UPF, the NEF shall reject the request and respond to the AF with an HTTP "403 Forbidden" status code with the response body including a ProblemDetails data structure including the "USER\_CONSENT\_NOT\_GRANTED" application error within the "cause" attribute.
* If the user consent is not required by local regulation and operator policy, or the user consent is granted, the NEF shall interact with UDM to retrieve the GPSI in the format of MSISDN using the received SUPI and MTC Provider Information or AF Identifier information by invoking Nudm\_SDM\_Get service, as described in clause 5.2.2.2 of 3GPP TS 29.503 [17]. Upon success, the UDM responds to the NEF with the requested MSIDN associated with the SUPI. The NEF shall then respond to the AF with the MSISDN that was received from the UDM.

If the NEF receives an error response from the UDM, the NEF shall respond to the AF with a proper error status code. If the NEF received from the UDM an error response including a "ProblemDetails" data structure with the "cause" attribute indicating an application error, the NEF shall relay this error response to the AF with a corresponding application error. If the UDM indicates that the requested UE Identifier is not available in the subscription data, the NEF shall respond to the AF with a "404 Not Found" error status code with the response body including a ProblemDetails data structure containing the "cause" attribute set to the "UE\_ID\_NOT\_AVAILABLE" application error to indicate that the AF specific UE ID is not available.

NOTE: The combination of IP address and Port Number can be used by 5GC to derive the UE private IP address assigned by 5GC if the UE is behind a NAT deployed with NAPT within UPF.

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

#### 5.25.3.1 Overview

The structure of the custom operation URIs of the UEId API is shown in Figure 5.25.3.1-1.



Figure 5.25.3.1-1: Custom operation URI structure of the UEId API

Table 5.25.3.1-1 provides an overview of the custom operations and applicable HTTP methods.

Table 5.25.3.1-1: Custom operations without associated resources

|  |  |  |  |
| --- | --- | --- | --- |
| Operation name | Custom operation URI | Mapped HTTP method | Description |
| Retrieve | /retrieve | POST | Request to retrieve AF specific UE ID information. |
| Get Msisdn | /get-msisdn | POST | Request to get the MSISDN of the UE. |

\*\*\* 7th Change \*\*\*

##### 5.25.3.2.3 Operation Definition

This operation shall support the request and response data structures and response codes specified in table 5.25.3.2.3-1 and table 5.25.3.2.3-2.

Table 5.25.3.2.3-1: Data structures supported by the POST Request Body on this resource

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | P | Cardinality | Description |
| MsisdnReq | M | 1 | Parameters to request to get the MSISDN of the UE. |

Table 5.25.3.2.3-2: Data structures supported by the POST Response Body on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Data type | P | Cardinality | Responsecodes | Description |
| MsisdnInfo | M | 1 | 200 OK | The requested MSISDN of the UE was returned successfully. |
| ProblemDetails | O | 0..1 | 403 Forbidden | If the AF request is not authorized, the NEF shall respond with "403 Forbidden". |
| ProblemDetails | O | 0..1 | 404 Not Found | If the requested UE ID does not exist or not available, the NEF shall respond with "404 Not Found". |
| n/a |  |  | 307 Temporary Redirect | Temporary redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4]. |
| n/a |  |  | 308 Permanent Redirect | Permanent redirection. The response shall include a Location header field containing an alternative URI of the resource located in an alternative NEF.Redirection handling is described in clause 5.2.10 of 3GPP TS 29.122 [4] |
| NOTE: The mandatory HTTP error status codes for the POST method listed in table 5.2.6-1 of 3GPP TS 29.122 [4] also apply. |

Table 5.25.3.2.3-3: Headers supported by the 307 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NEF. |

Table 5.25.3.2.3-4: Headers supported by the 308 Response Code on this resource

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Name | Data type | P | Cardinality | Description |
| Location | string | M | 1 | An alternative URI of the resource located in an alternative NEF. |

\*\*\* 8th Change \*\*\*

#### 5.25.5.1 General

This clause specifies the application data model supported by the UEId API. Table 5.25.5.1-1 specifies the data types defined for the UEId API.

Table 5.25.5.1-1: UEId service specific Data Types

|  |  |  |  |
| --- | --- | --- | --- |
| Data type | Clause defined | Description | Applicability |
| MsisdnReq | 5.25.5.2.4 | Represents the parameters to request to get the MSISDN of the UE. |  |
| MsisdnInfo | 5.25.5.2.5 | Represents the MSISDN information. |  |
| UeIdReq | 5.25.5.2.2 | Represents the parameters to requestAF specific UE ID retrieval. |  |
| UeIdInfo | 5.25.5.2.3 | Represents AF specific UE ID information. |  |

Table 5.25.5.1-2 specifies data types re-used by the UEId API from other specifications, including a reference to their respective specifications, and when needed, a short description of their use within the UEId API.

Table 5.25.5.1-2: Re-used Data Types

|  |  |  |
| --- | --- | --- |
| Data type | Reference | Comments |
| Dnn | 3GPP TS 29.571 [8] | Identifies a DNN. |
| ExternalId | 3GPP TS 29.122 [4] | Represents an External Identifier. |
| IpAddr | 3GPP TS 29.571 [8] | Identifes an IP address. |
| MacAddr48 | 3GPP TS 29.571 [8] | Identifies a MAC address. |
| Msisdn | 3GPP TS 29.122 [4] | Represents Mobile Subscriber ISDN number. |
| MtcProviderInformation | 3GPP TS 29.571 [8] | Indicates MTC provider information. |
| Port | 3GPP TS 29.122 [4] | Identifies a port, unsigned integer with valid values between 0 and 65535. |
| ProblemDetails | 3GPP TS 29.122 [4] | Represents error related information. |
| Snssai | 3GPP TS 29.571 [8] | Identifies the S-NSSAI. |
| SupportedFeatures | 3GPP TS 29.571 [8] | Represents the list of supported feature(s) and used to negotiate the applicability of the optional features. |
| Uinteger | 3GPP TS 29.571 [8] | Represents a unsigned integer. |

\*\*\* 9th Change \*\*\*

##### 5.25.5.3.4 Type: MsisdnReq

Table 5.25.5.2.4-1: Definition of type MsisdnReq

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability(NOTE 1) |
| afId | string | M | 1 | Represents the identifier of theAF that is sending the request. |  |
| appPortId | Port | O | 0..1 | Identifies an application port ID. See clause 9.2.3.24.4 of 3GPP TS 23.040 [62] for further details. |  |
| dnn | Dnn | O | 0..1 | Identifies a DNN. |  |
| ipDomain | string | O | 0..1 | The IPv4 address domain identifier.The attribute may only be present if the IPv4 address is provided in the "ueIpAddr" attribute. |  |
| mtcProviderId | MtcProviderInformation | O | 0..1 | Indicates MTC provider information. |  |
| portNumber | Port | O | 0..1 | Indicates the UDP or TCP port number associated with the UE IP address as provided in the "ueIpAddr" attribute. |  |
| snssai | Snssai | O | 0..1 | Identifies an S-NSSAI. |  |
| ueIpAddr | IpAddr | C | 0..1 | Identifies a UE IP Address.(NOTE 2) |  |
| ueMacAddr | MacAddr48 | C | 0..1 | Identifies a UE MAC Address. (NOTE 2) |  |
| suppFeat | SupportedFeatures | C | 0..1 | Indicates the list of Supported features used as described in clause 5.25.6.This attribute shall be provided when feature negotiation needs to take place. |  |
| NOTE 1: Properties marked with a feature as defined in clause 5.25.6 are applicable as described in clause 5.2.7 of 3GPP TS 29.122 [4]. If no feature is indicated, the related property is always applied.NOTE 2: One of the "ueIpAddr" attribute or "ueMacAddr" attribute shall be included. |

\*\*\* 10th Change \*\*\*

##### 5.25.5.2.5 Type: MsisdnInfo

Table 5.25.5.2.5-1: Definition of type MsisdnInfo

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| msisdn | Msisdn | M | 1 | Contians the Mobile Subscriber ISDN number uniquely identifying the user. |  |
| suppFeat | SupportedFeatures | C | 0..1 | Represents the features supported by both the AF and the NEF.This attribute shall be provided if feature negotiation needs to take place and it was provided by the AF in the corresponding request body. |  |
|  |  |  |  |  |  |

\*\*\* 11th Change \*\*\*

#### 5.25.7.3 Application Errors

The application errors defined for the UEId API are listed in table 5.25.7.3-1.

Table 5.25.7.3-1: Application errors

|  |  |  |  |
| --- | --- | --- | --- |
| **Application Error** | **HTTP status code** | **Description** | **Applicability** |
| REQUEST\_NOT\_AUTHORIZED | 403 Forbidden | Indicates that the AF specific UE ID retrieval request is not authorized. |  |
| USER\_CONSENT\_NOT\_GRANTED | 403 Forbidden | Indicates that the request is rejected because user consent is not granted. |  |
| UE\_ID\_NOT\_AVAILABLE | 404 Not Found | Indicates that the requested AF specific UE ID is not available. |  |
| UE\_NOT\_FOUND | 404 Not Found | Indicates that the requested UE address is not found. |  |

\*\*\* 12th Change \*\*\*

# 6 Security

TLS shall be used to support the security communication between the NEF and the AF over NEF Northbound interface as defined in clause 12 of 3GPP TS 33.501 [6]. The access to the NEFnorthbound APIs shall be authorized by means of OAuth2 protocol (see IETF RFC 6749 [13]), based on local configuration, using the "Client Credentials" or "authorization code" grant types. If OAuth2 is used, a client, prior to consuming services offered by the NEF Northbound APIs, shall obtain a "token" from the authorization server.

\*\*\* 13th Change \*\*\*

## 7.2 Security

When CAPIF is used for external exposure, before invoking the API exposed by the NEF, the AF as API invoker shall negotiate the security method (PKI, TLS-PSK or OAUTH2) with CAPIF core function and ensure the NEF has enough credential to authenticate the AF (see 3GPP TS 29.222 [12], clause 5.6.2.2 and clause 6.2.2.2).

If PKI or TLS-PSK is used as the selected security method between the AF and the NEF, upon API invocation, the NEF shall retrieve the authorization information from the CAPIF core function as described in 3GPP TS 29.222 [12], clause 5.6.2.4.

As specified in 3GPP TS 33.122 [14], the access to the NEF northbound APIs may be authorized by means of the OAuth2 protocol (see IETF RFC 6749 [13]), using the "Client Credentials" or "authorization code"grant types, where the CAPIF core function (see 3GPP TS 29.222 [12]) plays the role of the authorization server.

NOTE 1: In this release, only "Client Credentials" and "authorization code" grant types are supported.

If OAuth2 is used as the selected security method between the AF and the NEF, the AF, prior to consuming services offered by the NEF northbound APIs, shall obtain a "token" from the authorization server, by invoking the Obtain\_Authorization service, as described in 3GPP TS 29.222 [12], clause 5.6.2.3.2.

The NEF northbound APIs do not define any scopes for OAuth2 authorization. It is the NEF responsibility to check whether the AF is authorized to use an API based on the "token". Once the NEF verifies the "token", it shall check whether the NEF identifier in the "token" matches its own published identifier, and whether the API name in the "token" matches its own published API name. If those checks are passed, the AF has full authority to access any resource or operation for the invoked API.

NOTE 2: For aforementioned security methods, the NEF needs to apply admission control according to access control policies after performing the authorization checks.

NOTE 3: The security requirement in the current clause does not apply for the NiddConfigurationTrigger and the MsisdnLessMoSms APIs since they are the NEF initiated interaction with the AF. How the security scheme works for the NiddConfigurationTrigger and MsisdnLessMoSms APIs is left to configuration.

\*\*\* 14th Change \*\*\*

# A.23 UEId API

openapi: 3.0.0

info:

 title: 3gpp-ueid

 version: 1.1.0-alpha.1

 description: |

 API for UE ID service.

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externalDocs:

 description: 3GPP TS 29.522 V18.3.0; 5G System; Network Exposure Function Northbound APIs.

 url: 'https://www.3gpp.org/ftp/Specs/archive/29\_series/29.522/'

security:

 - {}

 - oAuth2ClientCredentials: []

servers:

 - url: '{apiRoot}/3gpp-ueid/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in subclause 5.2.4 of 3GPP TS 29.122.

paths:

 /retrieve:

 post:

 summary: Retrieve AF specific UE ID.

 operationId: RetrieveUEId

 requestBody:

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/UeIdReq'

 responses:

 '200':

 description: The requested information was returned successfully.

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/UeIdInfo'

 '307':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29122\_CommonData.yaml#/components/responses/default'

 /get-msisdn:

 post:

 summary: GET the MSISDN of the UE.

 operationId: GetMsisdn

 requestBody:

 required: true

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/MsisdnReq'

 responses:

 '200':

 description: The requested information was returned successfully.

 content:

 application/json:

 schema:

 $ref: '#/components/schemas/MsisdnInfo'

 '307':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/500'

 '503':

 $ref: 'TS29122\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29122\_CommonData.yaml#/components/responses/default'

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{tokenUrl}'

 scopes: {}

 schemas:

 UeIdReq:

 description: Represents the parameters to request the retrieval of AF specific UE ID.

 type: object

 properties:

 afId:

 type: string

 appPortId:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Port'

 dnn:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

 ipDomain:

 type: string

 mtcProviderId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MtcProviderInformation'

 portNumber:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Port'

 snssai:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

 ueIpAddr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/IpAddr'

 ueMacAddr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 required:

 - afId

 oneOf:

 - required: [ueIpAddr]

 - required: [ueMacAddr]

 UeIdInfo:

 description: Represents UE ID information.

 type: object

 properties:

 externalId:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/ExternalId'

 required:

 - externalId

 MsisdnReq:

 description: Represents the parameters to request the retrieval of MSISDN of the UE.

 type: object

 properties:

 afId:

 type: string

 appPortId:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Port'

 dnn:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Dnn'

 ipDomain:

 type: string

 mtcProviderId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MtcProviderInformation'

 portNumber:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Port'

 snssai:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Snssai'

 ueIpAddr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/IpAddr'

 ueMacAddr:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/MacAddr48'

 required:

 - afId

 oneOf:

 - required: [ueIpAddr]

 - required: [ueMacAddr]

 MsisdnInfo:

 description: Represents MSISDN information.

 type: object

 properties:

 msisdn:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/Msisdn'

 suppFeat:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

 required:

 - msisdn

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