**3GPP TSG-SA WG2 Meeting #165 S2-2410471**

**Hyderabad, IN, 14th – 18th Oct. 2024**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
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|  | **23.501** | **CR** | **xyz** | **rev** | **0** | **Current version:** | **19.0.0** |  |
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| *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 MSISDN verification operation support to Nnef\_UEId Service  |
|  |  |
| ***Source to WG:*** | AT&T, Ericsson, Nokia, Apple, Qualcomm, Interdigital, Deutsche Telekom |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | TEI19\_MVOSNS |  | ***Date:*** | 2024-10-12 |
|  |  |  |  |  |
| ***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 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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
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| ***Reason for change:*** | The Nnef\_UEId Service currently supports an MSISDN retrieval operation where the MSISDN is retrieved from the UDM and exposed to an authorized AF. There are many use cases in the industry where the operator would need to support MSISDN verification use cases in which the authorized AF is providing the MSISDN in the request and asks the operator to verify whether the UE’s MSISDN matches the AF-provided MSISDN in the request, as an alternative to the MSISDN retrieval exposure.In order to support such a need, the Nnef\_UEId Service is being enhanced to allow the NEF to perform verification between the MSISDN it retrieves from the UDM with the one it receives from the AF (in the request) and respond with the verification result accordingly (e.g. true/false depending on whether the two MSISDNs match or not).To address this new NEF exposed capability, it is proposed for the Nnef\_UEId Service to offer a new operation enabling UE’s MSISDN verification/matching between what is recorded in the UDM and what is provided in the request by an authorized AF. |
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| ***Summary of change:*** | Enhancing the Nnef\_UEId Service with a new operation to support MSISDN verification exposure (by the NEF), as an alternative to the MSISDN exposure to the authorized AF. |
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| ***Consequences if not approved:*** | The Nnef\_UEId Service won’t be able to support use cases in the industry, where MSISDN verification is needed, especially for the cases where due to user privacy regulations MSISDN exposure to the AF is not allowed and instead MSISDN verfication by NEF is an acceptable solution for the authorized AF.  |
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| ***Clauses affected:*** | 5.20, 7.2.8 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  |  |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

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

## 5.20 External Exposure of Network Capability

The Network Exposure Function (NEF) supports external exposure of capabilities of network functions. External exposure can be categorized as Monitoring capability, Provisioning capability, Policy/Charging capability, Analytics reporting capability and Member UE selection capability. The Monitoring capability is for monitoring of specific event for UE in 5G System and making such monitoring events information available for external exposure via the NEF. The Provisioning capability is for allowing external party to provision of information which can be used for the UE in 5G System. The Policy/Charging capability is for handling access and mobility management, QoS and charging policies for the UE based on the request from external party. The Analytics reporting capability is for allowing an external party to fetch or subscribe/unsubscribe to analytics information generated by 5G System (this is further defined in TS 23.288 [86]). The Member UE selection capability is for allowing an external party to acquire one or more list(s) of candidate UE(s) (among the list of target member UE(s) provided by the AF) and additional information that is based on the assistance information generated by 5G System based on some defined filtering criteria, the details are explained in clause 4.15.13 in TS 23.502 [3].

Monitoring capability is comprised of means that allow the identification of the 5G network function suitable for configuring the specific monitoring events, detect the monitoring event, and report the monitoring event to the authorised external party. Monitoring capability can be used for exposing UE's mobility management context such as UE location, reachability, roaming status, and loss of connectivity. Monitoring capability can also be used for exposing QoS monitoring result. AMF stores URRP-AMF information in the MM context to determine the NFs that are authorised to receive direct notifications from the AMF. UDM stores URRP-AMF information locally to determine authorised monitoring requests when forwarding indirect notifications. The Monitoring capability also allows AF to subscribe to the group status changes for a group, either a 5G VN group as described in clause 5.29.2, as well as a group configured by OA&M. In this case the AF is notified if the group member list is updated or a group member is no longer subscribed to the group.

Provisioning capability allows an external party to provision the Expected UE Behaviour or the 5G-VN group information or DNN and S-NSSAI specific Group Parameters or ECS Address Configuration Information or service specific information to 5G NF via the NEF. The provisioning comprises of the authorisation of the provisioning external third party, receiving the provisioned external information via the NEF, storing the information, and distributing that information among those NFs that use it. The externally provisioned data can be consumed by different NFs, depending on the data. In the case of provisioning the Expected UE Behaviour, the externally provisioned information which is defined as the Expected UE Behaviour parameters in clause 4.15.6.3 of TS 23.502 [3] or Network Control parameter in clause 4.15.6.3a of TS 23.502 [3] consists of information on expected UE movement, Expected UE Behaviour parameters or expected Network Configuration parameter. The provisioned Expected UE Behaviour parameters may be used for the setting of mobility management or session management parameters of the UE. In the case of provisioning the 5G-VN group information the externally provisioned information is defined as the 5G-VN group parameters in clause 4.15.6.7 of TS 23.502 [3] and it consists of some information on the 5G-VN group. In the case of the provisioning the DNN and S-NSSAI specific Group Parameters, the externally provisioned information is defined in clause 4.15.6.14 of TS 23.502 [3] and clause 5.20b. In the case of provisioning ECS address, the externally provisioned information is defined as the ECS Address Configuration Information in clause 4.15.6.3d of TS 23.502 [3]. The affected NFs are informed via the subscriber data update as specified in clause 4.15.6.2 of TS 23.502 [3]. The externally provisioned information which is defined as the Service Parameters in clause 4.15.6.7 of TS 23.502 [3] consists of service specific information used for supporting the specific service in 5G system. The provisioned Service Parameters may be delivered to the UEs. The affected NFs are informed of the data update.

Policy/Charging capability is comprised of means that allow the request for session and charging policy, enforce QoS policy, apply accounting functionality and requests to influence access and mobility management policies. It can be used for specific QoS/priority handling for the session of the UE, and for setting applicable charging party or charging rate.

Analytics reporting capability is comprised of means that allow discovery of type of analytics that can be consumed by external party, the request for consumption of analytics information generated by NWDAF.

Member UE selection capability is comprised of means that allows filtering and providing one or more list(s) of candidate UE(s) (among the list of target member UE(s) provided by the AF) and additional information that can be consumed by external party, the request for consumption of UE list generated by external party.

An NEF may support CAPIF functions for external exposure as specified in clause 6.2.5.1.

An NEF may support exposure of NWDAF analytics as specified in TS 23.288 [86].

The NEF may support exposure of 5GS and/or UE availability and capabilities for time synchronization service as specified in clause 5.27.1.8.

An NEF may support exposure of event based notifications and reports for NSACF as specified in clause 5.15.11.

An AF may only be able to identify the target UE of an AF request for external exposure of 5GC capabilities (e.g. Data Provisioning or for Event Exposure for a specific UE) by providing the UE's address information. In this case the NEF first needs to retrieve the Permanent identifier of the UE before trying to fulfil the AF request. The NEF may determine the Permanent identifier of the UE, as described in clause 4.15.3.2.13 of TS 23.502 [3], based on:

- the address of the UE as provided by the AF; this may be an IP address or a MAC address;

- the corresponding DNN and/or S-NSSAI information: this may have been provided by the AF or determined by the NEF based on the requesting AF; this is needed if the UE address is an IP address.

The NEF may provide a UE Identifier in the GPSI format of MSISDN to an authenticated and authorized AF:

- that fulfils the conditions described in clause 4.15.10A of TS 23.502 [3]; and

- that has explicitly requested a translation from the UE address to a unique UE identifier (via Nnef\_UEId service) when the UE MSISDN exposure is allowed and authorized by the operator; or

- the NEF may provide an AF specific UE Identifier to the AF:

- that has explicitly requested a translation from the address of the UE to a unique UE identifier (via Nnef\_UEId service); or

- that has implicitly requested a translation from the address of the UE to a AF specific UE Identifier by requesting external exposure about an individual UE identified by its address.

The AF may have its own means to maintain the AF specific UE Identifier through, e.g. an AF session. After the retrieval of an AF specific UE Identifier the AF shall not keep maintaining a mapping between this identifier and the UE IP address as this mapping may change.

The AF specific UE Identifier shall not correspond to a MSISDN; it is represented as a GPSI in the form of an External Identifier. When used as an AF specific UE identifier, the External Identifier provided by the 5GCN shall be different for different AF.

NOTE 1: This is to protect user privacy.

NOTE 2: The AF specific UE identifier is ensured to be unique across different AFs as defined in TS 23.003 [19] by configuration. Such configuration is assumed to be coordinated between the different involved entities (e.g. NEF(s) and UDM/UDR).

NOTE 3: Based on policies, the NEF can be configured to enforce restriction on the usage of AF specific UE identifier (e.g. rejection of a service request from AF not authorized to use the UE identifier).

The NEF may also provide MSISDN verification (via Nnef\_UEId service) to an authenticated and authorized AF that fulfils the conditions described in clause 4.15.10B of TS 23.502 [3].

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

### 7.2.8 NEF Services

The following NF services are specified for NEF:

Table 7.2.8-1: NF Services provided by NEF

| Service Name | Description | Reference in TS 23.502 [3] or other TS |
| --- | --- | --- |
| Nnef\_EventExposure | Provides support for event exposure. | 5.2.6.2 |
| Nnef\_PFDManagement | Provides support for PFDs management. | 5.2.6.3 |
| Nnef\_ParameterProvision | Provides support to provision information which can be used for the UE in 5GS. | 5.2.6.4 |
| Nnef\_Trigger | Provides support for device triggering. | 5.2.6.5 |
| Nnef\_BDTPNegotiation | Provides support for background data transfer policy negotiation and optionally notification for the renegotiation. | 5.2.6.6 |
| Nnef\_TrafficInfluence | Provide the ability to influence traffic routing. | 5.2.6.7 |
| Nnef\_ChargeableParty | Requests to become the chargeable party for a data session for a UE. | 5.2.6.8 |
| Nnef\_AFsessionWithQoS | Requests the network to provide a specific QoS for an AF session. | 5.2.6.9 |
| Nnef\_MSISDN-less\_MO\_SMS | Used by the NEF to send MSISDN-less MO SM to the AF. | 5.2.6.10 |
| Nnef\_ServiceParameter | Provides support to provision service specific information. | 5.2.6.11 |
| Nnef\_APISupportCapability | Provides support for awareness on availability or expected level of a service API. | 5.2.6.12 |
| Nnef\_NIDDConfiguration | Used for configuring necessary information for data delivery via the NIDD API. | 5.2.6.13 |
| Nnef\_NIDD | Used for NEF anchored MO and MT unstructured data transport. | 5.2.6.14 |
| Nnef\_SMContext | Provides the capability to create, update or release the SMF-NEF Connection. | 5.2.6.15 |
| Nnef\_AnalyticsExposure | Provides support for exposure of network analytics. | 5.2.6.16 |
| Nnef\_UCMFProvisioning | Provides the ability to configure the UCMF with dictionary entries consisting of UE manufacturer-assigned UE Radio Capability IDs, the corresponding UE radio capabilities, the corresponding UE Radio Capability for Paging and the (list of) associated IMEI/TAC value(s) via the NEF. The UE radio capabilities the NEF provides for a UE radio Capability ID can be in TS 36.331 [51] format, TS 38.331 [28] format or both formats. Also used for deletion (e.g. as no longer used) or update (e.g. to add or remove a (list of) IMEI/TAC value(s) associated to an entry) of dictionary entries in the UCMF. | 5.2.6.17 |
| Nnef\_ECRestriction | Provides support for queuing status of enhanced coverage restriction, or enable/disable enhanced coverage restriction per individual UEs. | 5.2.6.18 |
| Nnef\_ApplyPolicy | Provides the capability to apply a previously negotiated Background Data Transfer Policy to a UE or a group of UEs. | 5.2.6.19 |
| Nnef\_Location | Provides the capability to deliver UE location to AF. | 5.2.6.21 |
| Nnef\_AMInfluence | Provides the ability to influence access and mobility management related policies for one or multiple UEs. | 5.2.6.22 |
| Nnef\_AMPolicyAuthorization | Provides the ability to provide inputs that can be used by the PCF for deciding access and mobility management related policies. | 5.2.6.23 |
| Nnef\_AKMA | AKMA Application Key derivation service. | TS 33.535 [124] |
| Nnef\_Authentication | This service enables the consumer to authenticate and authorize the Service Level Device Identity as described in TS 23.256 [136]. | TS 23.256 [136] |
| Nnef\_TimeSynchronization | Provides the ability to support for (g)PTP or 5G access stratum based time synchronization service. | 5.2.6.25 |
| Nnef\_EASDeployment | EAS deployment service. | 5.2.6.26 |
| Nnef\_UEId | UE Identifier service, which supports the retrieval of an AF specific UE Identifier or GPSI in the form of MSISDN based on the UE address. It also supports MSISDN verification of given UE. | 5.2.6.27 |
| Nnef\_MBSTMGI | Allows AF to request allocation/deallocation of TMGI(s) for MBS Session. | TS 23.247 [129] |
| Nnef\_MBSSession | Allows AF to create, update and delete MBS Session. | TS 23.247 [129] |
| Nnef\_MBSGroupMsgDelivery | Allows AF to request to create, update and delete resource for group message delivery via MBS Session. | TS 23.247 [129] |
| Nnef\_ASTI | Provides the ability to influence 5G access stratum based time distribution configuration. | 5.2.6.28 |
| Nnef\_SMService | Used for SBI-based MO SM transmit through NEF for MSISDN-less MO SMS. | 5.2.6.29 |
| Nnef\_PDTQPolicyNegotiation | Provides support for negotiation for Planned Data Transfer with QoS requirements policy and optionally notification for the renegotiation. | 5.2.6.30 |
| Nnef\_MemberUESelectionAssistance | Provides one or more list(s) of candidate UE(s) (among the list of target member UE(s) provided by the AF) and additional information based on the parameters contained in the request from the AF. | 5.2.6.31 |
| Nnef\_DNAIMapping | Allows AF to obtain DNAI. | 5.2.6.34 |
| Nnef\_TrafficInfluenceData | Used in HR SBO as defined in TS 23.548 [130] to get AF Traffic Influence configuration from the V-NEF. | 5.2.6.35 |
| Nnef\_ECSAddress | This service is defined only for the support of HR-SBO. It allows AF to provide ECS Address Configuration Information for a group of UE or any UE to V-NEF. It allows V-SMF to subscribe and retrieve ECS Address Configuration Information. | 5.2.6.37 |

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