**3GPP TSG-SA2 Meeting #154 Adhoc *S2-22xxxxx***

**EMEETING, 16th – 22nd January, 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **23.501** | **CR** | **-** | **rev** | **-** | **Current version:** | **18.0.0** |  |
|  | | | | | | | | |
| *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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | Skeleton of PIN - 23.501 | | | | | | | | | |
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| ***Source to WG:*** | vivo | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | PIN | | | | |  | ***Date:*** | | | 2023-01-16 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | | 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 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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | |  | | | | | | | | |
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| ***Consequences if not approved:*** | |  | | | | | | | | |
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| ***Clauses affected:*** | |  | | | | | | | | |
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|  | | **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's revision history:*** | | 1st: Definitions and abbreviations for PIN  2nd: **New sub-clause** for PIN arch, which is under “4.4 Specific services” clause  3rd: (FFS) PINE ID related, including authentication and authorization  4th: **New sub-clauses** for High level function descriptions for PIN service, which is under “5 High level features” clause  5th: SMF impact for PIN  6th: NEF impact for PIN  7th: (FFS) PCF or UDM impact for supporting internal AF interaction for PIN  8th: (FFS) AF impact or new PIN AF  9th: UDR impact for PIN  10th: New service of NEF for PIN | | | | | | | | |

\* \* \* \* 1st change \* \* \* \*

3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**TBD**: TBD.3.2 Abbreviations

For the purposes of the present document, the abbreviations given in 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 TR 21.905 [1].

TBD TBD

\* \* \* \* 2nd change (new text for PIN arch) \* \* \* \*

4.4.X Personal IoT Networks service

TBD

\* \* \* \* 3rd change (FFS) \* \* \* \*

5.2.3 Identification and authentication

The network may authenticate the UE during any procedure establishing a NAS signalling connection with the UE. The security architecture is specified in TS 33.501 [29]. The network may optionally perform an PEI check with 5G-EIR.

Text for PINE identification and authentication

5.2.4 Authorisation

The authorisation for connectivity of the subscriber to the 5GC and the authorization for the services that the user is allowed to access based on subscription (e.g. Operator Determined Barring, Roaming restrictions, Access Type and RAT Type currently in use) is evaluated once the user is successfully identified and authenticated. This authorization is executed during UE Registration procedure.

Text for PINE authorisation

\* \* \* \* 4th change (new text for PIN service) \* \* \* \*

5.X Support for Personal IoT Networks service

5.X.1 General

TBD

5.X.2 PIN Session and PIN Session model

TBD

5.X.3 PIN Session management

TBD

5.X.4 PIN communication configuration

TBD

5.X.5 PIN policy management

TBD

\* \* \* \* 5th change \* \* \* \*

6.2.2 SMF

The Session Management function (SMF) includes the following functionality. Some or all of the SMF functionalities may be supported in a single instance of a SMF:

- Session Management e.g. Session Establishment, modify and release, including tunnel maintain between UPF and AN node.

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The SMF may also include following functionalities to support Personal IoT Networks service:

- TBD for supporting PIN service.

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\* \* \* \* 6th change \* \* \* \*

6.2.5.0 NEF functionality

The Network Exposure Function (NEF) supports the following independent functionality:

- Exposure of capabilities and events:

NF capabilities and events may be securely exposed by NEF for e.g. 3rd party, Application Functions, Edge Computing as described in clause 5.13.

NEF stores/retrieves information as structured data using a standardized interface (Nudr) to the Unified Data Repository (UDR).

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- Exposure of Personal IoT Networks service:

TBD.

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\* \* \* \* 7th change (FFS) \* \* \* \*

6.2.4 PCF

The Policy Control Function (PCF) includes the following functionality:

- Supports unified policy framework to govern network behaviour.

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- TBD for supporting PIN service with internal AF.

NOTE: The PCF accesses the UDR located in the same PLMN as the PCF.

The details of the PCF functionality are defined in clause 6.2.1 of TS 23.503 [45].

\* \* \* \* 7th change alternative (FFS) \* \* \* \*

6.2.7 UDM

The Unified Data Management (UDM) includes support for the following functionality:

- Generation of 3GPP AKA Authentication Credentials.

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- TBD for supporting PIN service with internal AF.

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\* \* \* \* 8th change (AF for PIN) \* \* \* \*

6.2.10 AF

The Application Function (AF) interacts with the 3GPP Core Network in order to provide services, for example to support the following:

- Application influence on traffic routing (see clause 5.6.7);

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- TBD for supporting PIN service.

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\* \* \* \* 8th change althernative (PIN AF) \* \* \* \*

6.2.X PIN AF

The PIN AF supports …

6.2.32 TSN AF

The TSN AF supports control plane translator functionality for the integration of the 5GS with a TSN network, this involves e.g.:

- 5GS Bridge management.

- Port and bridge management information exchange with DS-TT or NW-TT.

- Interactions with the CNC for 5GS Bridge configuration and reporting.

- determining the TSC Assistance Container and TSN QoS information by mapping TSN Stream(s) based on IEEE standards. The traffic pattern parameter determination may be based on PSFP (IEEE Std 802.1Q [98]) as specified in Annex I, clause I.1.

\* \* \* \* 9th change \* \* \* \*

6.2.11 UDR

The Unified Data Repository (UDR) supports the following functionality:

- Storage and retrieval of subscription data by the UDM.

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- TBD for supporting PIN service.

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\* \* \* \* 10th 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 AS 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 to retrieve AF specific UE Identifier based on UE address. | 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\_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\_TBD | PIN | 5.2.6.X |