**3GPP TSG-CT WG1 Meeting #131-eC1-214862**

**E-meeting, 19-27 August 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
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|  | **23.122** | **CR** | **0777** | **rev** | **-** | **Current version:** | **17.3.0** |  |
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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 | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:***  | No use of non-globally-unique SNPN identity for accessing SNPN using credentials from CH |
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| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | C1 |
|  |  |
| ***Work item code:*** | eNPN |  | ***Date:*** | 2021-08-25 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *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-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
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| ***Reason for change:*** | In case the SNPN provides connectivity for UEs with credentials owned by Credentials Holder, to enable the mobility between SNPN and SNPN, SA2 has added below NOTE in TS 23.501 sub 5.30.2.1 (added by agreed SA2 CR S2-2105015):"*NOTE 3: The use of SNPN with self-assignment model NID such that the combination of PLMN ID and NID is not globally unique is not assumed for the architecture described in Figure 5.30.2.9.3-1, Figure 5.30.2.9.2-1. and for SNPN - SNPN Mobility as described in clause 5.30.2.10.*"Figure 5.30.2.9.3-1 in TS 23.501 refers to "*Credentials Holder using AUSF and UDM for primary authentication and authorization*", Figure 5.30.2.9.2-1 in TS 23.501 refers to "*Credentials Holder using AAA Server for primary authentication and authorization*".For SNPN selection, the ME is configured with a "list of subscriber data" containing zero or more entries. Each entry of the "list of subscriber data" can consist a credentials holder controlled prioritized list of preferred SNPNs when the MS supports access to an SNPN using credentials from a credentials holder. Hence, Similar NOTE needs to be provided in TS 23.122. |
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| ***Summary of change:*** | It proposes to add a NOTE to indicate that when an SNPN supports UE access using credentials from a credentials holder separate from the SNPN, to enable UE mobility between SNPNs in 5GMM-IDLE mode, SNPN identities in the credentials holder controlled prioritized list of preferred SNPNs are assumed to be globally-unique SNPN identities. |
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| ***Consequences if not approved:*** | The non-globally-unique SNPN identity may be used in case of the SNPN provides connectivity for UEs with credentials owned by Credentials Holder and then the inter-SNPN idle mode mobility cannot be supported. |
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| ***Clauses affected:*** | 4.9.3.0 |
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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:*** |  |

\* \* \* First Change \* \* \* \*

#### 4.9.3.0 General

The ME is configured with a "list of subscriber data" containing zero or more entries. Each entry of the "list of subscriber data" consists of:

a) a subscriber identifier in the form of a SUPI with the SUPI format "network specific identifier" containing a network-specific identifier or with the SUPI format "IMSI" containing an IMSI, except when the SNPN uses:

1) the EAP based primary authentication and key agreement procedure using the EAP-AKA'; or

2) the 5G AKA based primary authentication and key agreement procedure;

NOTE 1: A subscriber identifier in the form of a SUPI with the SUPI format "network specific identifier" containing a network-specific identifier or with the SUPI format "IMSI" containing an IMSI, is available in USIM if the SNPN uses the EAP based primary authentication and key agreement procedure using the EAP-AKA' or the 5G AKA based primary authentication and key agreement procedure.

NOTE 1a: If the MS supports access to an SNPN using credentials from a credentials holder and is configured with the SNPN selection parameters as described in g), the subscriber identifier in the form of a SUPI configured in the ME or the USIM needs to be with the SUPI format "network specific identifier".

b) credentials except when the SNPN uses:

1) the EAP based primary authentication and key agreement procedure using the EAP-AKA'; or

2) the 5G AKA based primary authentication and key agreement procedure;

NOTE 2: Credentials are available in USIM if the SNPN uses the EAP based primary authentication and key agreement procedure using the EAP-AKA' or the 5G AKA based primary authentication and key agreement procedure.

c) an SNPN identity of the subscribed SNPN;

d) optionally, the unified access control configuration indicating for which access identities (see 3GPP TS 24.501 [64]) the ME is configured in the SNPN;

f) optionally, the pre-configured URSP (see 3GPP TS 24.526 [77]);

g) optionally, the default configured NSSAI (see 3GPP TS 24.501 [64]); and

h) optionally, if the MS supports access to an SNPN using credentials from a credentials holder, the SNPN selection parameters, consisting of:

1) a user controlled prioritized list of preferred SNPNs, where each entry contains an SNPN identity;

2) a credentials holder controlled prioritized list of preferred SNPNs, where each entry contains an SNPN identity; and

3) a credentials holder controlled prioritized list of Group IDs for Network Selection (GINs).

Editor's Note: It is FFS whether a mechanism is needed to prevent registration attempts from MSs not explicitly configured to select an SNPN in an SNPN which broadcasts an indication that the SNPN allows registration attempts from MSs that are not explicitly configured to select the SNPN.

NOTE 3: How the ME is configured with the "list of subscriber data" is out of scope of 3GPP in this release of the specification.

NOTE 4: Multiple entries can include the same subscriber identifier and credentials.

NOTE 5: Handling of more than one entry with the same SNPN identity is left up to MS implementation.

NOTE 6: Handling of the case when the SNPN uses the EAP based primary authentication and key agreement procedure using the EAP-AKA' or the 5G AKA based primary authentication and key agreement procedure and the MS has multiple valid USIMs (3GPP TS 31.102 [40]) is left up to MS implementation.

NOTE 6a: To enable UE mobility between SNPNs in 5GMM-IDLE mode, SNPN identities in the credentials holder controlled prioritized list of preferred SNPNs are assumed to be globally-unique SNPN identities.

The MS which supports onboarding services in SNPN shall be pre-configured with default UE credentials and may be pre-configured with onboarding SNPN network selection information. Contents of the onboarding SNPN network selection information are MS implementation specific. Contents of default UE credentials are out of scope of 3GPP.

Additionally, if the MS has a USIM with a PLMN subscription, the ME may be configured with the SNPN selection parameters associated with the PLMN subscription, consisting of:

a) a user controlled prioritized list of preferred SNPNs, where each entry contains an SNPN identity;

b) a credentials holder controlled prioritized list of preferred SNPNs, where each entry contains an SNPN identity; and

c) a credentials holder controlled prioritized list of GINs.

The MS shall maintain a list of "temporarily forbidden SNPNs" and a list of "permanently forbidden SNPNs" in the ME. Each entry of those lists consists of an SNPN identity. If the MS supports access to an SNPN using credentials from a credentials holder, the MS shall maintain one list of "temporarily forbidden SNPNs" and one list of "permanently forbidden SNPNs" per entry of the "list of subscriber data" or the PLMN subscription, and shall use the lists associated with the selected entry of the "list of subscriber data" or the selected PLMN subscription.

The MS shall add an SNPN to the list of "temporarily forbidden SNPNs" which is, if the MS supports access to an SNPN using credentials from a credentials holder, associated with the selected entry of the "list of subscriber data" or the selected PLMN subscription, if a message with cause value #74 "Temporarily not authorized for this SNPN" (see 3GPP TS 24.501 [64]) is received by the MS in response to an LR request from the SNPN. In addition, if:

- the message is integrity-protected; or

- the message is not integrity-protected, and the value of the SNPN-specific attempt counter for that SNPN is equal to the MS implementation specific maximum value as defined in 3GPP TS 24.501 [64];

then the MS shall start an MS implementation specific timer not shorter than 60 minutes.

The MS shall remove an SNPN from the list of "temporarily forbidden SNPNs" which is, if the MS supports access to an SNPN using credentials from a credentials holder, associated with the selected entry of the "list of subscriber data" or the selected PLMN subscription, if:

a) there is a successful LR after a subsequent manual selection of the SNPN;

b) the MS implementation specific timer not shorter than 60 minutes expires;

c) the MS is configured to use timer T3245 and timer T3245 expires;

d) the MS is not configured to use timer T3245, the timer T3247 expires and the value of the SNPN-specific attempt counter for that SNPN is less than the MS implementation specific maximum value as defined in 3GPP TS 24.501 [64];

e) the MS is switched off;

f) an entry of the "list of subscriber data" with the subscribed SNPN identity identifying the SNPN is updated or the USIM is removed if:

- EAP based primary authentication and key agreement procedure using EAP-AKA'; or

- 5G AKA based primary authentication and key agreement procedure;

 was performed in the selected SNPN; or

g) the selected entry of the "list of subscriber data" is updated or USIM is removed for the selected PLMN subscription.

If an SNPN is removed from the list of "temporarily forbidden SNPNs" list, the MS shall stop the MS implementation specific timer not shorter than 60 minutes, if running.

The MS shall add an SNPN to the list of "permanently forbidden SNPNs" which is, if the MS supports access to an SNPN using credentials from a credentials holder, associated with the selected entry of the "list of subscriber data" or the selected PLMN subscription, if a message with cause value #75 "Permanently not authorized for this SNPN" (see 3GPP TS 24.501 [64]) is received by the MS in response to an LR request from the SNPN.

The MS shall remove an SNPN from the list of "permanently forbidden SNPNs" which is, if the MS supports access to an SNPN using credentials from a credentials holder, associated with the selected entry of the "list of subscriber data" or the selected PLMN subscription, if:

a) there is a successful LR after a subsequent manual selection of the SNPN;

b) the MS is configured to use timer T3245 and timer T3245 expires;

c) the MS is not configured to use timer T3245, the timer T3247 expires and the value of the SNPN-specific attempt counter for that SNPN is less than the MS implementation specific maximum value as defined in 3GPP TS 24.501 [64] ;

d) an entry of the "list of subscriber data" with the subscribed SNPN identity identifying the SNPN is updated or the USIM is removed if:

- EAP based primary authentication and key agreement procedure using EAP-AKA'; or

- 5G AKA based primary authentication and key agreement procedure;

 was performed in the selected SNPN; or

e) the selected entry of the "list of subscriber data" is updated or USIM is removed for the selected PLMN subscription.

When the MS reselects to a cell in a shared network, and the cell is a suitable cell for multiple SNPN identities received in the broadcast information as specified in 3GPP TS 38.331 [65], the AS indicates these multiple SNPN identities to the NAS according to 3GPP TS 38.304 [61]. The MS shall select one of these SNPNs. If the registered SNPN is available among these SNPNs, the MS shall not select a different SNPN.

The MS operating in SNPN access mode shall maintain one or more lists of "5GS forbidden tracking areas for roaming", each associated with an SNPN and, if the MS supports access to an SNPN using credentials from a credentials holder, entry of the "list of subscriber data" or the PLMN subscription. The MS shall use the list of "5GS forbidden tracking areas for roaming" associated with the selected SNPN and, if the MS supports access to an SNPN using credentials from a credentials holder, the selected entry of the "list of subscriber data" or the selected PLMN subscription. If the MS selects a new SNPN, the MS shall keep the list of "5GS forbidden tracking areas for roaming" associated with the previously selected SNPN and, if the MS supports access to an SNPN using credentials from a credentials holder, the selected entry of the "list of subscriber data" or the selected PLMN subscription. If the number of the lists to be kept is higher than supported, the MS shall delete the oldest stored list of "5GS forbidden tracking areas for roaming". The MS shall delete all lists of "5GS forbidden tracking areas for roaming", when the MS is switched off and periodically (with period in the range 12 to 24 hours). The MS shall delete the list of "5GS forbidden tracking areas for roaming" associated with an SNPN:

a) when the entry with the subscribed SNPN identifying the SNPN in the "list of subscriber data" is updated;

b) when the USIM is removed if:

- the EAP based primary authentication and key agreement procedure using the EAP-AKA'; or

- the 5G AKA based primary authentication and key agreement procedure;

 was performed in the selected SNPN; or

c) if the MS supports access to an SNPN using credentials from a credentials holder, when the list of "5GS forbidden tracking areas for roaming" is associated with:

- the entry of the "list of subscriber data" and the entry of the "list of subscriber data" is updated; or

- the PLMN subscription and USIM is removed.

NOTE 7: The number of the lists of "5GS forbidden tracking areas for roaming" supported by the MS is MS implementation specific.

If a message with cause value #15 (see 3GPP TS 24.501 [64]) is received by an MS operating in SNPN access mode, the TA is added to the list of "5GS forbidden tracking areas for roaming" of the selected SNPN and, if the UE supports access to an SNPN using credentials from a credentials holder, the selected entry of the "list of subscriber data" or the selected PLMN subscription,. The MS shall then search for a suitable cell in the same SNPN but belonging to a TA which is not in the "5GS forbidden tracking areas for roaming" list of the selected SNPN and, if the UE supports access to an SNPN using credentials from a credentials holder, the selected entry of the "list of subscriber data" or the selected PLMN subscription.

The MS should maintain a list of SNPNs for which the N1 mode capability was disabled due to receipt of a reject from the network with 5GMM cause #27 "N1 mode not allowed". When the MS disables its N1 mode capability due to receipt of a reject from an SNPN with 5GMM cause #27 "N1 mode not allowed":

- the MS should add the SNPN identity of the SNPN which sent a reject with 5GMM cause #27 "N1 mode not allowed" to the list of SNPNs for which the N1 mode capability was disabled and should start timer TJ if timer TJ is not already running. The number of SNPNs for which the N1 mode capability was disabled that the MS can store is implementation specific, but it shall be at least one. The value of timer TJ is MS implementation specific, but shall not exceed the maximum possible value of background scanning timer T as specified in clause 4.4.3.3.1;

- in automatic SNPN selection, the MS shall not select an SNPN for which the N1 mode capability was disabled as SNPN selection candidates, unless no other SNPN is available;

- if the MS is not configured to use timer T3245, the MS maintains a list of SNPN-specific attempt counters for 3GPP access as specified in 3GPP TS 24.501 [64], and T3247 expires, then the MS removes for each SNPN-specific attempt counter for 3GPP access that has a value greater than zero and less than the MS implementation-specific maximum value the respective SNPN from the list of SNPNs for which the N1 mode capability was disabled, as specified in clause 5.3.20.3 in 3GPP TS 24.501 [64]; and

- the MS shall delete stored information on SNPNs for which the N1 mode capability was disabled when the MS is switched off, the USIM is removed, the entries of the "list of subscriber data" for the SNPNs are updated, or timer TJ expires.

NOTE 8: The expiry of timer TJ does not cause a reset of the SNPN-specific attempt counters for 3GPP access (see 3GPP TS 24.501 [64]).

Editor's note: Whether the maximum value of TJ needs to be compared with background scanning time T for the PLMN selection is FFS.

If the MS does not support access to an SNPN using credentials from a credentials holder, the MS should maintain a list of SNPNs where the N1 mode capability was disabled due to IMS voice not available and the MS's usage setting was "voice centric". If the MS supports access to an SNPN using credentials from a credentials holder, the MS should maintain one or more lists of SNPNs where the N1 mode capability was disabled due to IMS voice not available and the MS's usage setting was "voice centric", each associated with selected entry of the "list of subscriber data" or the PLMN subscription. When the MS disables its N1 mode capability due to IMS voice not available and the MS's usage setting was "voice centric":

- the MS should add the SNPN identity of the SNPN to the list of SNPNs where voice service was not possible in N1 mode and should start timer TK if timer TK is not already running. The number of SNPNs that the MS can store where voice services is not possible is implementation specific, but it shall be at least one. The value of timer TK is MS implementation specific;

- in automatic SNPN selection the MS shall not consider SNPNs where voice service was not possible in N1 mode as SNPN selection candidates, unless no other SNPN is available; and

- the MS shall delete stored information on SNPNs where voice service was not possible in N1 mode when the MS is switched off, the USIM is removed, the entries of the "list of subscriber data" for the SNPNs are updated, or timer TK expires.

\* \* \* End of Change \* \* \* \*