**3GPP TSG-SA WG2 Meeting #154AH-ES2-2301443**

**E-Meeting, 16 – 20 Jan. 2023** *was S2-2300369r20*

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.501** | **CR** | **3883** | **rev** | **1** | **Current version:** | **18.0.0** |  |
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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 | **X** | Radio Access Network |  | Core Network | **X** |

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| ***Title:*** | UE discover, select and access to a Hosting network for Localized services | | | | | | | | | |
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| ***Source to WG:*** | MediaTek Inc., Nokia, Nokia Shanghai Bell, Ericsson, Futurewei, LG Electronics, InterDigital | | | | | | | | | |
| ***Source to TSG:*** | SA2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNPN\_Ph2 | | | | |  | ***Date:*** | | | 2023-01-05 |
|  |  | | | |  | |  | | |  |
| ***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 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-15 (Release 15) Rel-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18)* | |
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| ***Reason for change:*** | | Based on the conlcusions in KI#4 in TR 23.700-08, the SNPN Hosting network selection is added to the current NPN clauses | | | | | | | | |
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| ***Summary of change:*** | | The descriptions are added as below  - the UE configuration for the selection of an SNPN as Hosting network (5.30.2.3)  - the automatic network selection to the UE for an SNPN as Hosting network (5.30.2.4, 5.30.2.4.2) | | | | | | | | |
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| ***Consequences if not approved:*** | | UE cannot discover, select and access to an SNPN that provides access for Localized services | | | | | | | | |
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| ***Clauses affected:*** | | 5.30.2.3, 5.30.2.4, 5.30.2.4.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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's revision history:*** | |  | | | | | | | | |

\*\*\*\* FIRST CHANGE \*\*\*\*

#### 5.30.2.3 UE configuration and subscription aspects

An SNPN-enabled UE is configured with the following information for each subscribed SNPN:

- PLMN ID and NID of the subscribed SNPN;

- Subscription identifier (SUPI) and credentials for the subscribed SNPN;

- Optionally, an N3IWF FQDN and an identifier of the country where the configured N3IWF is located;

- Optionally, if the UE supports access to an SNPN using credentials from a Credentials Holder:

- User controlled prioritized list of preferred SNPNs;

- Credentials Holder controlled prioritized list of preferred SNPNs, each entry of the list includes;

- an SNPN identifier; and

- optionally, time validity information, e.g., the start and the end time of allowing to access an SNPN, if the UE supports access to an SNPN providing access for Localized services

- Credentials Holder controlled prioritized list of GINs, each entry of the list includes;

- a GIN; and

- optionally, time validity information, e.g., the start and the end time of allowing to access an SNPN, if the UE supports access to an SNPN providing access for Localized services

- Protection scheme for concealing the SUPI as defined in TS 33.501 [29];

NOTE: Additionally the UE can be configured with indication to use anonymous SUCI as defined in TS 24.501 [47].

For an SNPN-enabled UE with SNPN subscription, the Credentials Holder controlled prioritized lists of preferred SNPNs and GINs may be updated by the Credentials Holder using the Steering of Roaming (SoR) procedure as defined in Annex C of TS 23.122 [17]. Updating Credentials Holder controlled prioritized lists of preferred SNPNs and GINs via the Steering of Roaming (SoR) procedure is not applicable for Credentials Holder with AAA Server.

Editor’s note: Whether the Credentials Holder controlled prioritized lists of preferred SNPNs/GINs can be extended or if a new list type is defined to provide entries with validity information to the UE and if any capability indications are needed for UEs that support those validity conditions is FFS and to be determined by CT1.

A subscription of an SNPN is either:

- identified by a SUPI containing a network-specific identifier that takes the form of a Network Access Identifier (NAI) using the NAI RFC 7542 [20] based user identification as defined in clause 28.7.2 of TS 23.003 [19]. The realm part of the NAI may include the NID of the SNPN; or

- identified by a SUPI containing an IMSI.

NOTE 1: As to route network signalling to AUSF and UDM instances serving the SNPN-enabled UE, the UE can be configured with Routing Indicator locally or updated with Routing Indicator using the UE Parameters Update via UDM Control Plane procedure defined in clause 4.20 of TS 23.502 [3]. When the SNPN credential is stored in the USIM, the Routing Indicator is provisioned in the USIM, when the SNPN credential is stored in the ME, the Routing Indicator is provisioned in the ME.

In the case of access to an SNPN using credentials owned by a Credentials Holder as specified in clause 5.30.2.9.2 and clause 5.30.2.9.3, the SUPI shall also contain identification for the Credentials Holder (i.e. the realm in the case of Network Specific Identifier based SUPI or the MCC and MNC in the case of an IMSI based SUPI). In the case of access to an SNPN using credentials owned by a Credentials Holder using AAA-S as specified in clause 5.30.2.9.2, only Network Specific Identifier based SUPI is supported.

NOTE 2: When Credentials Holder is an SNPN, and the MCC and MNC of the SNPN is not unique (e.g. MCC =999 is used and MNC is not coordinated amongst the SNPNs), then IMSI based SUPI is not supported as the MCC and MNC need not be globally unique always; instead USIM credentials are supported using Network Specific Identifier based SUPI.

NOTE 3: Network Specific Identifier are not supported for the case the Credentials Holder is provided by a PLMN.

NOTE 4: It is assumed that normally the SNPN and the Credentials Holder use different PLMN ID. If the SNPN and CHs (where CH can be another SNPN or a PLMN) share PLMN ID, and IMSI based SUPI is used, then the Routing Indicator can be used for AUSF/UDM discovery and selection as long as the Routing Indicator values are coordinated among the involved SNPN and CHs. When the PLMN ID is not shared between SNPNs and CHs (where CH can be another SNPN or a PLMN) and IMSI based SUPI is used, then PLMN ID is sufficient to be used for AUSF/UDM discovery & selection unless the CHs deploys multiple AUSF/UDM in which case also the Routing Indicator can be used as long as the Routing Indicator values are coordinated within the CH.

An SNPN-enabled UE that supports access to an SNPN using credentials from a Credentials Holder and that is equipped with a PLMN subscription may additionally be configured with the following information for SNPN selection and registration using the PLMN subscription in SNPN access mode:

- User controlled prioritized list of preferred SNPNs;

- Credentials Holder controlled prioritized list of preferred SNPNs, each entry of the list includes;

- an SNPN identifier; and

- optionally, time validity information, e.g., the start and the end time of allowing to access an SNPN, if the UE supports access to an SNPN providing access for Localized services

- Credentials Holder controlled prioritized list of preferred GINs, each entry of the list includes;

- a GIN; and

- optionally, time validity information, e.g., the start and the end time of allowing to access an SNPN, if the UE supports access to an SNPN providing access for Localized services

For an SNPN-enabled UE with PLMN subscription, the Credentials Holder controlled prioritized lists of preferred SNPNs and GINs may be updated by the Credentials Holder using the Steering of Roaming (SoR) procedure as defined in Annex C of TS 23.122 [17].

Editor’s note: Whether the Credentials Holder controlled prioritized lists of preferred SNPNs/GINs can be extended or if a new list type is to be defined to provide entries with validity information to the UE and if any capability indications are needed for UEs that support those validity conditions is FFS and to be determined by CT1.

When the Credentials Holder updates a UE with the Credentials Holder controlled prioritized lists of preferred SNPNs and GINs the UE may perform SNPN selection again, e.g. to potentially select a higher prioritized SNPN or to potentially select an SNPN that provides access for Localized services.

\*\*\*\* SECOND CHANGE \*\*\*\*

##### 5.30.2.4.1 General

An SNPN-enabled UE supports the SNPN access mode. When the UE is set to operate in SNPN access mode the UE selects and registers with SNPNs over Uu as described in clause 5.30.2.4. Network selection in SNPN access mode for access to SNPN services via Untrusted non-3GPP access, Trusted non-3GPP access and Wireline access is specified in clause 5.30.2.12, clause 5.30.2.13 and clause 5.30.2.14 respectively. Access network selection in SNPN access mode for 5G NSWO is specified in clause 6.3.12b.

Emergency services are supported in SNPN access mode over Uu as defined in clause 5.16.4.1. Support for Emergency in SNPN access mode via Untrusted non-3GPP access is specified in clause 5.30.2.12.

If a UE is not set to operate in SNPN access mode, even if it is SNPN-enabled, the UE does not select and register with SNPNs. A UE not set to operate in SNPN access mode performs PLMN selection procedures as defined in clause 4.4 of TS 23.122 [17]. For a UE capable of simultaneously connecting to an SNPN and a PLMN, the setting for operation in SNPN access mode is applied only to the Uu interface for connection to the SNPN. Clause D.4 provides more details.

An SNPN-enabled UE that supports access to an SNPN using credentials from a Credentials Holder and that is equipped with a PLMN subscription needs to first enter SNPN access mode to be able to select SNPNs. Once the UE has entered SNPN access mode, SNPN selection is performed as described in clause 5.30.2.4. Once an SNPN has been selected the UE attempts registration in the SNPN using the PLMN credentials.

NOTE: Details of activation and deactivation of SNPN access mode are up to UE implementation.

When a UE is set to operate in SNPN access mode the UE does not perform normal PLMN selection procedures as defined in clause 4.4 of TS 23.122 [17].

UEs operating in SNPN access mode read the information described in clause 5.30.2.2 from the broadcast system information and take them into account during network selection. Furthermore, if the UE supports access to an SNPN providing access for Localized services, and the end user enables to access the Localized services the UE may select an SNPN providing access for Localized services.

NOTE X: Details of how the user enables/disables access to localized services are up to UE implementation.

\*\*\*\* THIRD CHANGE \*\*\*\*

##### 5.30.2.4.2 Automatic network selection

NOTE 1: If the UE has multiple SNPN subscriptions it is assumed that the subscription to use for automatic selection is determined by implementation specific means prior to network selection.

If the UE supports accessing an SNPN providing access for Localized services, for automatic network selection, the UE selects and attempts registration on available SNPN in the following order:

- In the case that UE supports access to an SNPN using Credentials from a Credentials Holder, and the end user enables to access Localized services, and the time validity information for the SNPN is available and is met, the UE first selects and attempts registration on available and allowable SNPNs which broadcasts the indication that access using credentials from a Credentials Holder is supported in the following order:

- SNPNs in the Credentials Holder controlled prioritized list of preferred SNPNs (in prioritized order); The entries on the list of preferred SNPNs that do not meet time validity information are ignored;

- SNPNs, which additionally broadcast a GIN contained in the Credentials Holder controlled prioritized list of preferred GINs (in prioritized order); The entries on the list of preferred GINs that do not meet time validity information are ignored.

- For the case above if no SNPN has been chosen, and for all the other cases, the UE then continues, by selecting and attempting in the following order,

- SNPN not providing access for Localized services the UE was last registered with (if available) or the equivalent SNPN (if available);

- the subscribed SNPN, which is identified by the PLMN ID and NID for which the UE has SUPI and credentials;

- SNPNs in the user controlled prioritized list of preferred SNPNs (in priority order);

- SNPNs in the Credentials Holder controlled prioritized list of preferred SNPNs (in priority order) without time validity information;

- SNPNs, which additionally broadcast a GIN contained in the Credentials Holder controlled prioritized list of preferred GINs (in priority order) without time validity information;

- SNPNs, which additionally broadcast an indication that the SNPN allows registration attempts from UEs that are not explicitly configured to select the SNPN, i.e. the broadcasted NID or GIN is not present in the Credentials Holder controlled prioritized lists of preferred SNPNs/GINs in the UE.

If the UE supports accessing an SNPN providing access for Localized services and the end user enables to access Localized services the UE shall check regularly if SNPNs for which a validity condition is valid become available.

NOTE: Details of this (e.g., timer handling) can be specified by CT1.

If the UE does not support to access an SNPN providing access for Localized services or the end user does not enable to access the Localized services, for automatic network selection the UE selects and attempts registration on available and allowable SNPNs in the following order:

- the SNPN not providing access for Localized services the UE was last registered with (if available) or the equivalent SNPN (if available);

- the subscribed SNPN, which is identified by the PLMN ID and NID for which the UE has SUPI and credentials.;

- If the UEs supports access to an SNPN using credentials from a Credentials Holder then the UE continues by selecting and attempting registration on available and allowable SNPNs which broadcast the indication that access using credentials from a Credentials Holder is supported in the following order:

- SNPNs in the user controlled prioritized list of preferred SNPNs (in priority order);

- SNPNs in the Credentials Holder controlled prioritized list of preferred SNPNs (in priority order) without time validity information; The entries on the list of preferred SNPNs with time validity information are ignored;

- SNPNs, which additionally broadcast a GIN contained in the Credentials Holder controlled prioritized list of preferred GINs (in priority order) without time validity information; The entries on the list of preferred SNPNs with time validity information are ignored;

NOTE 2: If multiple SNPNs are available that broadcast the same GIN, the order in which the UE selects and attempts a registration with those SNPNs is implementation specific.

- SNPNs, which additionally broadcast an indication that the SNPN allows registration attempts from UEs that are not explicitly configured to select the SNPN, i.e. the broadcasted NID or GIN is not present in the Credentials Holder controlled prioritized lists of preferred SNPNs/GINs in the UE.

NOTE 3: If multiple SNPNs are available that broadcast the indication that the SNPN allows registration attempts from UEs that are not explicitly configured to select the SNPN, the order in which the UE selects and attempts a registration with those SNPNs is implementation specific.

When a UE performs Registration or Service Request to an SNPN, the UE shall indicate the PLMN ID and NID as broadcast by the selected SNPN to NG-RAN. NG-RAN shall inform the AMF of the selected PLMN ID and NID.

\*\*\*\* END OF CHANGES \*\*\*\*