**SA WG2 Meeting #143eS2-210xxxx**

**Feb 24th – March 9th, 2021 ; Elbonia (revision of S2-210)**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **23.501** | **CR** | **xx** | **rev** | **-** | **Current version:** | **16.7.0** |  |
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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 | **x** | Core Network | **X** |

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| ***Title:*** | KI#4: T1-b – O-SNPN selection and onboarding support indicator. | | | | | | | | | |
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| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, InterDigital, Convida Wireless | | | | | | | | | |
| ***Source to TSG:*** | S2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNPN | | | | |  | ***Date:*** | | | 2021-01-18 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***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 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:*** | | TR 23.700-07 conclusion for the following item needs to be implemented in TS 23.501:   |  |  | | --- | --- | | KI#4: T1-b | Impact to SIB indicator for onboarding support (O-SNPN selection) to enable Network sharing |   The NG-RAN of the Onboarding network includes an indication for Onboarding enabled in the SIB (per O-SNPN, considering that the NG-RAN can be shared) so that the UE can discover and select an appropriate O-SNPN. The UE may or may not be pre-configured with O-SNPN network selection information (e.g. O-SNPN network identifiers). | | | | | | | | |
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| ***Summary of change:*** | | Implement the above conclusion as follows:   1. NG-RAN broadcasts support for Onboarding indication per O-SNPN. | | | | | | | | |
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| ***Consequences if not approved:*** | | eNPN Feature not implemented | | | | | | | | |
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| ***Clauses affected:*** | | 5.30.2.2, 5.30.2.3, 5.30.2.4 | | | | | | | | |
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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*

#### 5.30.2.2 Broadcast system information

NG-RAN nodes which provide access to SNPNs broadcast the following information:

- One or multiple PLMN IDs

- List of NIDs per PLMN ID identifying the non-public networks NG-RAN provides access to

NOTE 1: It is assumed that an NG-RAN node supports broadcasting a total of twelve NIDs. Further details are defined in TS 38.331 [28].

NOTE°2: The presence of a list of NIDs for a PLMN ID indicates that the related PLMN ID and NIDs identify SNPNs.

- Optionally a human-readable network name per NID.

NOTE 3: The human-readable network name per NID is only used for manual SNPN selection. The mechanism how human-readable network name is provided (i.e. whether it is broadcasted or unicasted) to the UE is specified in TS 38.331 [28].

- Optionally information, as described in TS 38.300 [27], TS 38.331 [28] and in TS 38.304 [50], to prevent UEs not supporting SNPNs from accessing the cell, e.g. if the cell only provides access to non-public networks.

- Optionally onboarding enabled indication per SNPN, in which case the SNPN can be selected as an Onboarding SNPN.

#### 5.30.2.3 UE configuration and subscription aspects

An SNPN-enabled UE is configured with subscriber identifier (SUPI), credentials for each subscribed SNPN identified by the combination of PLMN ID and NID. If an SNPN-enabled UE is configured with an N3IWF, it is also configured with an identifier of the country where the configured N3IWF is located.

A UE enabled to support UE Onboarding, shall be pre-configured with Default UE credentials, and the UE may be pre-configured with additional information for selection of Onboarding SNPN (see clause 5.30.2.4).

A subscriber 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 TS 23.003 [19] clause 28.7.2. The realm part of the NAI may include the NID of the SNPN; or

- identified by a SUPI containing an IMSI.

An SNPN-enabled UE supports the SNPN access mode. When the UE is set to operate in SNPN access mode the UE only selects and registers with SNPNs over Uu as described in clause 5.30.2.4.

Emergency services are not supported in SNPN access mode.

NOTE 1: Voice support with emergency services in SNPN access mode is not specified in this release.

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. Annex D.4 provides more details.

NOTE 2: Details of activation and deactivation of SNPN access mode are up to UE implementation.

#### 5.30.2.4 Network selection in SNPN access mode

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 available PLMN IDs and list of available NIDs from the broadcast system information and take them into account during network selection.

For automatic network selection, the UE selects and attempts to register with the available SNPN identified by a PLMN ID and NID for which the UE has SUPI and credentials. If multiple SNPNs are available that the UE has respective SUPI and credentials for, then how the UE selects an SNPN is based on UE implementation.

If the UE initiates the UE Onboarding procedure, the UE shall select an Onboarding Network (ON) that broadcasts that onboarding is enabled. If the UE has been configured with a list of SNPNs to use for Onboarding SNPN selection, the UE selects an Onboarding SNPN according to the configuration, and if there is no Onboarding SNPN available according to the pre-configuration or the UE has no pre-configuration the UE may select and attempt UE Onboarding using any available Onboarding SNPN.

NOTE 1: The trigger for the UE to initiate the UE Onboarding procedure is UE dependent. This trigger could be, e.g., a UE not yet provisioned with credentials for a subscription or an interaction with the user.

Editor's note: It is FFS whether the pre-configuration information for onboarding SNPN selection can include more information than SNPN identifier(s) e.g. Group ID(s).

For manual network selection UEs operating in SNPN access mode provide to the user the list of SNPNs (each is identified by a PLMN ID and NID) and related human-readable names (if available) of the available SNPNs the UE has respective SUPI and credentials for.

NOTE 2: The details of SNPN selection is defined in TS 23.122 [17].

When a UE performs Initial Registration to an SNPN, the UE shall indicate the selected NID and the corresponding PLMN ID to NG-RAN. NG-RAN shall inform the AMF of the selected PLMN ID and NID.