**3GPP TSG-SA WG2 Meeting #143-eS2-210xxxx**

**E-Meeting, 24th February – 09th March 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **23.501** | **CR** | **<CR#>** | **rev** | **<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 |  | Radio Access Network |  | Core Network | **X** |

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|  |
| ***Title:***  | Onboarding, initial connectivity in SNPNs |
|  |  |
| ***Source to WG:*** | Ericsson |
| ***Source to TSG:*** | SA2 |
|  |  |
| ***Work item code:*** | eNPN |  | ***Date:*** | <Res\_date> |
|  |  |  |  |  |
| ***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 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:*** | Provide support for UEs getting initial connectivity for the Onboarding procedure. |
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| ***Summary of change:*** |  |
|  |  |
| ***Consequences if not approved:*** |  |
|  |  |
| ***Clauses affected:*** |  |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  |  |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

\*\*\*\*\* Start of changes \*\*\*\*\*

\*\*\*\*\* Start of changes \*\*\*\*\*

## 5.30 Support for non-public networks

### 5.30.1 General

A Non-Public Network (NPN) is a 5GS deployed for non-public use, see TS 22.261 [2]. An NPN is either:

- a Stand-alone Non-Public Network (SNPN), i.e. operated by an NPN operator and not relying on network functions provided by a PLMN, or

- a Public Network Integrated NPN (PNI-NPN), i.e. a non-public network deployed with the support of a PLMN.

NOTE: An NPN and a PLMN can share NG-RAN as described in clause 5.18.

Stand-alone NPN are described in clause 5.30.2 and Public Network Integrated NPNs are described in clause 5.30.3.

Aspects related to Onboarding and Remote Provisioning of UEs are described in clause 5.30.X

\*\*\*\*\* Next change \*\*\*\*\*

### 5.30.X Onboarding and Remote Provisioning of UEs in Non-Public Networks

#### 5.30.X.1 General

Editor’s Note: This clause should have an overview or general description of onboarding both SNPNs and PNI-NPNs. The applicability scenarios, and a general architecture. Where differences appear between SNPN and PNI-NPNs, the description should be moved to the following sections.

#### 5.30.X.2 Onboarding and Remote Provisioning of UEs in SNPNs

##### 5.30.X.2.1 General

Editor’s Note: This clause should have an overview or general description of onboarding in SNPNs, including an introduction to the two components below.

##### 5.30.X.2.2 Architecture

5.30.x.2.2.1 General

Editor’s Note: Architectural aspects should be described in this clause.

5.30.x.2.2.2 Broadcast Information

Editor’s Note: This clause should described the broadcasting information for supporting onboarding in NG-RAN

5.30.x.2.2.3 UE Configuration Aspects

Editor’s Note: This clause should described the configuration required or assumed in the UE for supporting onboarding.

##### 5.30.X.2.4 Initial Connectivity

5.30.X.2.4.1 General

The first step of Onboarding a UE in an SNPN requires the UE to select and get initial connectivity from the network, and includes mutual authentication of the UE and authorization from the SO-SNPN. Clauses 5.30.X.2.4.2 and 5.30.X.2.4.3 specify these procedures when the Onboarding Network is an SNPN (O-SNPN) for which the UE does not have credentials.

NOTE x: The trigger for the UE to start the Onboarding procedure is UE dependent. It can be, e.g., due to the UE not being provisioned with NPN credentials, due to the press of a combination of keys in UE, etc.

When Onboarding Network is a PLMN for which the UE has already got credentials, the procedures are specified in clause 5.30.X.2.4.4.

5.30.X.2.4.2 Network selection when ON is an SNPN

When the UE wants to get initial connectivity for onboarding, the UE shall select a network broadcasting the Onboarding enabled indication, in which case, the network can be selected as an Onboarding Network (ON).

The UE may be pre-configured with a list of O-SNPN network selection information (e.g. O‑SNPN network identifiers) that helps the UE in selecting an appropriate ON. If the UE is pre-configured with O‑SNPN network selection information, the UE selects an O-SNPN according to the configuration, and if there is no O-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 O-SNPN, according to implementation specific logic.

If initial connectivity is not granted through the selected ON, the UE may select a different ON and retry the procedure.

5.30.X.2.4.3 Initial registration when ON is SNPN

When the UE has selected an O-SNPN according to clause 5.30.X.2.3.2, the UE establishes an RRC connection towards the NG-RAN node of the O-SNPN. The UE provides an indication at RRC level that the RRC connection is for onboarding. This indication allows the NG-RAN to select an appropriate AMF that supports the UE onboarding procedures.

NOTE x: As the configuration information in the UE does not include a Requested NSSAI for onboarding, the UE does not include any Requested NSSAI in RRC.

Once the UE has got RRC connectivity, the UE shall initiate the NAS registration procedure by sending a NAS Registration Request message with the following characteristics:

- The UE sets the 5GS Registration Type to the value Onboarding.

- The UE shall provide an Onboarding SUCI derived from an Onboarding SUPI. The Onboarding SUPI shall be derived from the Default UE Credentials and shall be encoded as a network specific identifier taking the format of a NAI (i.e. user@realm).

NOTE y: As the configuration information in the UE does not include a Requested NSSAI for onboarding, the UE does not include any Requested NSSAI in NAS signalling.

NOTE z: The exact details for creating the Onboarding SUCI are specified in TS 23.003 [19] and TS 33.501 [29].

When the AMF receives a Registration request for Onboarding, the AMF starts an authentication procedure towards the AUSF. The AMF may use the realm of the Onboarding SUCI's NAI for selecting an appropriate AUSF, as per regular procedures described in clause 6.3.4.

NOTE y: Authentication details are specified in TS 33.501 [29].

The AUSF may determine the corresponding DCS identity or address/domain, based on the the realm of the NAI or based on information (e.g. DCS address) locally provisioned at the AUSF. The AUSF, then, starts an EAP authentication procedure towards the DCS, as per TS 33501 [29].

Upon successful authentication received from DCS, the AUSF forwards to AMF the result of authentication along with all the information received from the DCS, for example, the deconcealed Onboarding SUPI, the address of the SO‑SNPN, and the SNPN security info.

Upon successful authentication received from AUSF, the AMF determines the SO-SNPN of the UE. This can be done with the information received from the DCS or with localy configured information. The AMF, then, determines the address of the PS in the SO-SnPN, and sends an authorization request to the PS including the Onboarding SUPI of the UE.

Upon successful atuhentication, the AMF informes the UE of the result of the registration.

Editor’s Note: additional information provided to the UE and AMF is TBD.

5.30.X.2.4.4 Initial Connectivity and Initial Registration when ON is a PLMN

When the ON is a PLMN for which the UE has got credentials, regular network selection and regular initial registration procedures apply.

\*\*\*\*\* End of changes \*\*\*\*\*