**3GPP TSG-RAN WG3 Meeting #119bis eR3-231978**

**Online, 17th – 26th April 2023 was R3-231506**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.300** | **CR** |  | **rev** |  | **Current version:** | **17.4.0** |  |
|  | | | | | | | | |
| *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 |  | Radio Access Network | **X** | Core Network | **X** |

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| ***Title:*** | On introduction of R18 eNPN | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | China Telecom, Huawei, ZTE, CATT | | | | | | | | | |
| ***Source to TSG:*** | R3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | eNPN\_Ph2-NGRAN-Core | | | | |  | ***Date:*** | | | 2023.04.07 |
|  |  | | | |  | |  | | |  |
| ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
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| ***Reason for change:*** | | The new WID on Further Enhancement of Private Network Support for NG-RAN was approved in RP-230788.  This draft CR is to add the support of equivalent SNPNs. | | | | | | | | |
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| ***Summary of change:*** | | Section 9.4: Modify specification descriptions in the Roaming and Access Restrictions to support equivalent SNPNs, including the change of serving SNPN when UE experience an Xn handover from serving SNPN to an equivalent SNPN.  Section 16.6.1: Clarify that NR-NR Dual Connectivity within the equivalent SNPNs can be supported.  Section 16.6.2: Clarify that cell (re)selection and mobility among equivalent SNPNs can be supported. | | | | | | | | |
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| ***Consequences if not approved:*** | | The enhanced NPN phase 2 is not supported. | | | | | | | | |
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| ***Clauses affected:*** | | 9.4, 16.6.1, 16.6.2 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

*START OF CHANGE*

## 9.4 Roaming and Access Restrictions

The roaming and access restriction information for a UE includes information on restrictions to be applied for subsequent mobility action during CM-CONNECTED state. It may be provided by the AMF and also may be updated by the AMF later.

It includes the forbidden RAT, the forbidden area and the service area restrictions as specified in TS 23.501 [3]. It also includes serving PLMN/SNPN and may include a list of equivalent PLMNs or a list of equivalent SNPNs. It may also include PNI-NPN mobility restrictions (i.e. list of CAGs allowed for the UE and whether the UE can also access non-CAG cells). The gNB shall consider that roaming or access to CAG cells is only allowed if PNI-NPN mobility information is available for the UE.

Upon receiving the roaming and access restriction information for a UE, if applicable, the gNB should use it to determine whether to apply restriction handling for subsequent mobility action, e.g., handover, redirection.

If the roaming and access restriction information is not available for a UE at the gNB, the gNB shall consider that there is no restriction for subsequent mobility actions except for the PNI-NPN mobility as described in TS 23.501 [3].

Only if received over NG or Xn signalling, the roaming and access restriction information shall be propagated over Xn by the source gNB during Xn handover. If the Xn handover results in a change of serving PLMN (to an equivalent PLMN), the source gNB shall replace the serving PLMN with the identity of the target PLMN and move the serving PLMN to the equivalent PLMN list, before propagating the roaming and access restriction information. If the Xn handover results in a change of serving SNPN (to an equivalent SNPN), the source gNB shall replace the serving SNPN with the identity of the target SNPN and move the serving SNPN to the equivalent SNPN list, before propagating the roaming and access restriction information.

If NG-RAN nodes with different versions of the XnAP or NGAP protocol are deployed, information provided by the 5GC within the NGAP Mobility Restriction List may be lost in the course of Xn mobility. In order to avoid such loss of information at Xn handover or UE context retrieval due to a source NG-RAN node or an old NG-RAN node not able to recognise the entire content, the source NG-RAN node or the old NG-RAN node may provide an 5GC Mobility Restriction List Container to the target NG-RAN node or the new NG-RAN node, containing the Mobility Restriction List as received from the 5GC. The target NG-RAN node or the new NG-RAN node shall use the information contained in the 5GC Mobility Restriction List Container as the Mobility Restriction List, except for the Serving PLMN/SNPN and the Equivalent PLMNs/SNPNs, which the NG-RAN node shall use from the XnAP Mobility Restriction List. The 5GC Mobility Restriction List Container may be propagated at future Xn handover and UE context retrieval.

*NEXT CHANGE*

## 16.6 Stand-Alone NPN

### 16.6.1 General

An SNPN is a network deployed for non-public use which does not rely on network functions provided by a PLMN (see clause 4.8). An SNPN is identified by a PLMN ID and NID (see clause 8.2) broadcast in SIB1.

An SNPN-capable 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. When the UE is not set to operate in SNPN access mode, the UE performs normal PLMN selection procedures.

Emergency services and ETWS /CMAS can be supported by SNPNs. An IMS Emergency call support indication is provided per SNPN to inform the UE which SNPN(s) support emergency bearer. In normal service state the indication is provided in the same way as in case of PLMNs (see clause 16.5.2). In limited service state and for emergency services other than eCall over IMS, a UE is informed whether an SNPN of the cell supports emergency services over NG-RAN from a per SNPN broadcast indication (*imsEmergencySupportForSNPN*). The broadcast indicator for an SNPN may be set to "support" if any AMF of the SNPN supports IMS emergency bearer services.

NR-NR Dual Connectivity across SNPNs is supported.

*Editor notes: It will be further checked when we have conclusion on whether and how to support equivalent SNPN in NR-DC, and it may also depend on RAN2.*

### 16.6.2 Mobility

#### 16.6.2.1 General

The same principles as described in 9.2 apply to SNPN except for what is described below.

UEs operating in SNPN access mode only (re)select cells within the selected/registered SNPN or equivalent SNPNs and a cell can only be considered as suitable if the PLMN and NID broadcast by the cell matches the selected/registered SNPN or equivalent SNPNs.

In addition, manual selection of SNPN(s) is supported, for which HRNN(s) can be optionally provided.

The roaming and access restrictions applicable to SNPN are described in clause 9.4.

#### 16.6.2.2 Inactive Mode

The mobility of a UE in inactive mode builds on existing functionality described in clause 9.2.2 and is limited to the SNPN(s) identified within the mobility restrictions received in the UE context.

#### 16.6.2.3 Connected Mode

The NG-RAN node is aware of the SNPN ID(s) supported by neighbour cells.

At the time of handover, cells that do not support the serving SNPN ID or the equivalent SNPNs within the mobility restrictions received in the UE context are not considered as candidate target cells by the source NG-RAN node.

The target NG-RAN node performs access control. In case it cannot accept the handover for the serving SNPN the target NG-RAN node fails the handover including an appropriate cause value.

*END OF CHANGE*