**3GPP TSG- Meeting #**

**25 January – 5 February 2021**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  |  | **CR** |  | **rev** | **2** | **Current version:** | **16.4.0** |  |
|  | | | | | | | | |
| *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:*** | Support of NTN RAT identification and NTN RAT restrictions | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | , Huawei, Thales | | | | | | | | | |
| ***Source to TSG:*** |  | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_NTN\_solutions | | | | |  | ***Date:*** | | |  |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **B** |  | | | | | ***Release:*** | | |  |
|  | *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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | SA2 has agreed in S2-2008310 to add explicit access restriction for all types of NR RATs based on satellite constellations, i.e. NR(LEO), NR(MEO), NR(GEO) and NR(OTHERSAT) that may be used as 3GPP access in 5GS.  If supported, the access restriction should apply on initial access, i.e. the AMF should be aware of the satellite access type; and also at RAN mobility in connected mode, i.e. the RAN needs to be aware of restrictions. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | 1. Bits in the *RAT Restriction Information* IE (in the Mobility Restriction List) are assigned to NR satellite access, for different constellations. 2. Similarly for bits in the *Primary RAT Restriction* IE in the *Extended RAT Restriction* IE, also in the Mobility Restriction List. 3. Additional codepoints (for NR satellite access) are added to the *RAT Information* IE associated with a TAC. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | No ability to support access and mobility restrictions for 3GPP RATs relating to satellite access. No ability for AMF to identify satellite access of NR. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 9.3.1.85, 9.3.1.125, 9.3.1.126, 9.4.5 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | | **X** |  | Other core specifications | | | | TS 38.423 CR#0488 | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

#### 9.3.1.85 Mobility Restriction List

This IE defines roaming or access restrictions for subsequent mobility action for which the NG-RAN provides information about the target of the mobility action towards the UE, e.g., handover, or for SCG selection during dual connectivity operation or for assigning proper RNAs. NG-RAN behaviour upon receiving this IE is specified in TS 23.501 [9].

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| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Serving PLMN | M |  | PLMN Identity  9.3.3.5 |  | - |  |
| **Equivalent PLMNs** |  | *0..<maxnoofEPLMNs>* |  | Allowed PLMNs in addition to Serving PLMN.  This list corresponds to the list of "equivalent PLMNs" as defined in TS 24.501 [26].  This list is part of the roaming restriction information. Roaming restrictions apply to PLMNs other than the Serving PLMN and Equivalent PLMNs. | - |  |
| >PLMN Identity | M |  | 9.3.3.5 |  | - |  |
| **RAT Restrictions** |  | *0..<maxnoofEPLMNsPlusOne>* |  | This IE contains RAT restriction related information as specified in TS 23.501 [9]. | - |  |
| >PLMN Identity | M |  | 9.3.3.5 |  | - |  |
| >RAT Restriction Information | M |  | BIT STRING {  e-UTRA (0),  nR (1), nR-unlicensed (2),  nR-LEO (3),  nR-MEO (4),  nR-GEO (5),  nR-OTHERSAT (6)}  (SIZE(8, …)) | Each position in the bitmap represents a RAT.  If a bit is set to "1", the respective RAT is restricted for the UE.  If a bit is set to "0", the respective RAT is not restricted for the UE.  Bits 3-7 reserved for future use. | - |  |
| >Extended RAT Restriction Information | O |  | 9.3.1.126 | If this IE is included, the *RAT Restriction Information* IE is ignored. | YES | ignore |
| **Forbidden Area Information** |  | *0..<maxnoofEPLMNsPlusOne>* |  | This IE contains Forbidden Area information as specified in TS 23.501 [9]. | - |  |
| >PLMN Identity | M |  | 9.3.3.5 |  | - |  |
| **>Forbidden TACs** |  | *1..<maxnoofForbTACs>* |  |  | - |  |
| >>TAC | M |  | 9.3.3.10 | The TAC of the forbidden TAI. | - |  |
| **Service Area Information** |  | *0..<maxnoofEPLMNsPlusOne>* |  | This IE contains Service Area Restriction information as specified in TS 23.501 [9]. | - |  |
| >PLMN Identity | M |  | 9.3.3.5 |  | - |  |
| **>Allowed TACs** |  | *0..<maxnoofAllowedAreas>* |  |  | - |  |
| >>TAC | M |  | 9.3.3.10 | The TAC of the allowed TAI. | - |  |
| **>Not Allowed TACs** |  | *0..<maxnoofAllowedAreas>* |  |  | - |  |
| >>TAC | M |  | 9.3.3.10 | The TAC of the not-allowed TAI. | - |  |
| Last E-UTRAN PLMN Identity | O |  | PLMN Identity  9.3.3.5 | Indicates the E-UTRAN PLMN ID from where the UE formerly handed over to 5GS and which is preferred in case of subsequent mobility to EPS. | YES | ignore |
| Core Network Type Restriction for Serving PLMN | O |  | ENUMERATED (EPCForbidden,…) | Indicates whether the UE is restricted to connect to EPC for the Serving PLMN as specified in TS 23.501 [9]. | YES | ignore |
| **Core Network Type Restriction for Equivalent PLMNs** |  | *0..<maxnoofEPLMNs>* |  |  | YES | ignore |
| >PLMN Identity | M |  | 9.3.3.5 | Includes any of the Equivalent PLMNs listed in the *Mobility Restriction List* IE for which CN Type restriction applies as specified in TS 23.501 [9]. | - |  |
| >Core Network Type Restriction | M |  | ENUMERATED (EPCForbidden, 5GCForbidden,…) | Indicates whether the UE is restricted to connect to EPC or to 5GC for this PLMN. |  |  |
| NPN Mobility Information | O |  | 9.3.1.184 |  | YES | reject |

**>>> NEXT CHANGE <<<**

#### 9.3.1.125 RAT Information

This IE provides RAT related information associated with a TAC, used as described in TS 23.501 [9].

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| RAT Information | M |  | ENUMERATED (unlicensed, nb-IoT, ..., nR-LEO,  nR-MEO,  nR-GEO,  nR-OTHERSAT) |  |

#### 9.3.1.126 Extended RAT Restriction Information

This IE provides RAT restrictions as specified in TS 23.501 [9].

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description |
| Primary RAT Restriction | M |  | BIT STRING {  e-UTRA (0),  nR (1), nR-unlicensed (2), nR-LEO (3),  nR-MEO (4),  nR-GEO (5),  nR-OTHERSAT (6)}  (SIZE(8, …)) | Each position in the bitmap represents a RAT.  If a bit is set to "1", the respective RAT is restricted for the UE.  If a bit is set to "0", the respective RAT is not restricted for the UE.  Bits 3-7 reserved for future use.  The Primary RAT is the RAT used in the access cell, or target cell. |
| Secondary RAT Restriction | M |  | BIT STRING {  e-UTRA (0),  nR (1), e-UTRA-unlicensed (2), nR-unlicensed (3)}  (SIZE(8, …)) | Each position in the bitmap represents a RAT.  If a bit is set to "1", the respective RAT is restricted for the UE.  If a bit is set to "0", the respective RAT is not restricted for the UE.  Bits 4-7 reserved for future use.  A Secondary RAT is a RAT used in any cell serving the UE excluding the PCell. |

**>>> NEXT CHANGE <<<**

### 9.4.5 Information Element Definitions

-- ASN1START

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-- Information Element Definitions

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-- \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

NGAP-IEs {

itu-t (0) identified-organization (4) etsi (0) mobileDomain (0)

ngran-Access (22) modules (3) ngap (1) version1 (1) ngap-IEs (2) }

**\*\*\* skip unchanged text in same section \*\*\***

RAT-Information ::= ENUMERATED {

unlicensed,

nb-IoT,

...,

nR-LEO,

nR-MEO,

nR-GEO,

nR-OTHERSAT

}