**3GPP TSG-RAN WG3 Meeting #112-e *R3-211611***

**Online, 17 – 27 May 2021**

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| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **38.423** | **CR** | **0590** | **rev** | **1** | **Current version:** | **15.11.0** |  |
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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 | **x** | Core Network |  |

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| ***Title:***  |  IE in the Mobility Restriction List |
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| ***Source to WG:*** | Nokia, Nokia Shanghai Bell, Ericsson (tbc), Others? |
| ***Source to TSG:*** | R3 |
|  |  |
| ***Work item code:*** | NR\_newRAT-Core |  | ***Date:*** | 2021-05-06 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-15 |
|  | *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:*** | The *RAT Restriction Information* IE is a bitmap that indicates whether the respective RAT is restricted (bit set to ‘1’) or not restricted (bit set to ‘0’) for the UE. However, the semantics description for the IE states “*the sending node shall set bits 2-7 to "0", the sender shall ignore bits 2-7*” which creates a problem if the tracking area contains NG-RAN nodes of mixed releases. If the NG-RAN node receives a Mobility Restriction List of a later release, it will potentially re-encode the reserved bits from ‘1’ to ‘0’, thereby changing a “restricted” RAT to “not restricted”.Note that nowhere else in the NG/Xn/F1/E1 specifications does a sending node re-encode a bitmap. Typically, specifications avoid using “shall” statements in semantics descriptions and avoid describing sending node behaviour. |
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| ***Summary of change:*** | The semantics description is modified so that:1. The sending NG-RAN node (i.e. source or MN) does not re-encode the bitmap, which implicitly means it sends the same bitmap that was previously received over NG/Xn.
2. Bits 2-7 are reserved for future use.

Impact analysis:Impact assessment towards the previous version of the specification (same release):This CR has an impact under protocol point of view. The impact can be considered isolated because the change affects only mobility restrictions. |
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| ***Consequences if not approved:*** | An NG-RAN node may erroneously allocate radio resources to the UE using a RAT that is supposed to be restricted for the UE. |
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| ***Clauses affected:*** | 9.2.3.53 |
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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 ...  |
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| ***Other comments:*** |  |
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| ***This CR's revision history:*** |  |

#### 9.2.3.53 Mobility Restriction List

This IE defines roaming or access restrictions for subsequent mobility actions for which the NR-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. If the NG-RAN receives the *Mobility Restriction List* IE, it shall overwrite previously received restriction information. NG-RAN behaviour upon receiving this IE is specified in TS 23.501 [7].

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| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Serving PLMN | M |  | PLMN Identity9.2.2.4 |  | – |  |
| **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 [30].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 |  | 9.2.2.4 |  | – |  |
| **RAT Restrictions** |  | *0..<maxnoofPLMNs>* |  | This IE contains RAT restriction related information as specified in TS 23.501 [7]. | – |  |
| >PLMN Identity | M |  | 9.2.2.4 |  | – |  |
| >RAT Restriction Information | M |  | BIT STRING {e-UTRA (0),nR (1) }(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 2-7 are reserved for future use.  | – |  |
| **Forbidden Area Information** |  | *0..<maxnoofPLMNs>* |  | This IE contains Forbidden Area information as specified in TS 23.501 [7]. | – |  |
| >PLMN Identity | M |  | 9.2.2.4 |  | – |  |
| **>Forbidden TACs** |  | *1..<maxnoofForbiddenTACs>* |  |  | – |  |
| >>TAC | M |  | 9.2.2.5 | The TAC of the forbidden TAI. | – |  |
| **Service Area Information** |  | *0..<maxnoofPLMNs>* |  | This IE contains Service Area Restriction information as specified in TS 23.501 [7]. | – |  |
| >PLMN Identity | M |  | 9.2.2.4 |  | – |  |
| **>Allowed TACs** |  | *0..<maxnooAllowedAreas>* |  |  | – |  |
| >>TAC | M |  | 9.2.2.5 | The TAC of the allowed TAI. | – |  |
| **>Not Allowed TACs** |  | *0..<maxnooAllowedAreas>* |  |  | – |  |
| >>TAC | M |  | 9.2.2.5 | The TAC of the not-allowed TAI. | – |  |
| Last E-UTRAN PLMN Identity | O |  | 9.2.2.4 | 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 [7]. | YES | ignore |
| **Core Network Type Restriction for Equivalent PLMNs** |  | *0..<maxnoofEPLMNs>* |  |  | YES | ignore |
| >PLMN Identity | M |  | 9.2.2.4 | 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 [7]. | – |  |
| >Core Network Type Restriction | M |  | ENUMERATED(EPCForbidden, 5GCForbidden, …) | Indicates whether the UE is restricted to connect to EPC or to 5GC for this PLMN. | – |  |

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| Range bound | Explanation |
| maxnoofEPLMNs | Maximum no. of equivalent PLMNs. Value is 15. |
| maxnoofPLMNs | Maximum no. of allowed PLMNs. Value is 16. |
| maxnoofForbiddenTACs | Maximum no. of forbidden Tracking Area Codes. Value is 4096. |
| maxnoofAllowedAreas | Maximum no. of allowed or not allowed Tracking Areas. Value is 16. |