**3GPP TSG-RAN WG3 Meeting # 116-e *draft* R3-223862**

**Online, May 9th 2022 - May 19th 2022**

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| *CR-Form-v12.1* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.473** | **CR** | **0921** | **rev** | **1** | **Current version:** | **17.0.0** |  |
|  | | | | | | | | |
| *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 |  |

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|  | | | | | | | | | | |
| ***Title:*** | F1AP corrections for NR-U | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, Deutsche Telekom, Qualcomm Incorporated | | | | | | | | | |
| ***Source to TSG:*** | RAN3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_ENDC\_SON\_MDT\_enh | | | | |  | ***Date:*** | | | 2022-05-16 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***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)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | The name of *Channel occupancy time percentage* IE does not indicate that the IEis associated to DL.  The semantic description of *Channel occupancy time percentage* IE does not clearly indicate that the IE is associated to one NR-U Channel.  The semantic description for *NR-U ARFCN* IE can be clarified with relevant references. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | The *Channel occupancy time percentage* IE is renamed as *Channel occupancy time percentage DL*, and it is clarified that the IE is associated to one NR-U Channel. Corresponding ASN.1 encoding is aligned.  The semantic description for *NR-U ARFCN* IE is improved with references to tables in TS 38.101-1 containing allowed values for NR-U ARFCN.  Impact Analysis  The CR impacts the previous version of the specification with NBC ASN.1 changes. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | The *Channel occupancy time percentage* and *NR-U ARFCN* IEs lack clarity. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 2, 9.2.1.23, 9.3.1.10 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | |  | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

----------------------------------------------- Start of Changes ---------------------------------------------------------

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

*(text unchanged skipped)*

[44] 3GPP TS 23.304: "Proximity based Services (ProSe) in the 5G System (5GS)".

[45] 3GPP TS 38.351: “NR; Sidelink Relay Adaptation Protocol (SRAP) Specification”.

[46] 3GPP TS 37.213: "NR; Physical layer procedures for shared spectrum channel access".

----------------------------------------------- Next Change ---------------------------------------------------------

#### 9.2.1.23 RESOURCE STATUS UPDATE

This message is sent by gNB-DU to gNB-CU to report the results of the requested measurements.

Direction: gNB-DU → gNB-CU.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| IE/Group Name | Presence | Range | IE type and reference | Semantics description | Criticality | Assigned Criticality |
| Message Type | M |  | 9.3.1.1 |  | YES | ignore |
| Transaction ID | M |  | 9.3.1.23 |  | YES | reject |
| gNB-CU Measurement ID | M |  | INTEGER (1..4095,...) | Allocated by gNB-CU | YES | reject |
| gNB-DU Measurement ID | M |  | INTEGER (1..4095,...) | Allocated by gNB-DU | YES | ignore |
| Hardware Load Indicator | O |  | 9.3.1.136 |  | YES | ignore |
| TNL Capacity Indicator | O |  | 9.3.1.128 |  | YES | ignore |
| **Cell Measurement Result** |  | *0..1* |  |  | YES | ignore |
| **>Cell Measurement Result Item** |  | *1 .. <maxCellingNBDU >* |  |  | - |  |
| >>Cell ID | M |  | NR CGI  9.3.1.12 |  | - |  |
| >>Radio Resource Status | O |  | 9.3.1.129 |  | - |  |
| >>Composite Available Capacity Group | O |  | 9.3.1.130 |  | - |  |
| >>Slice Available Capacity | O |  | 9.3.1.134 |  | - |  |
| >>Number of Active UEs | O |  | 9.3.1.135 |  | - |  |
| >>NR-U Channel List |  | *0..1* |  |  | YES | ignore |
| >>>NR-U Channel Item |  | *1..<maxnoofNR-UChannels>* |  |  | - |  |
| >>>>NR-U Channel ID | M |  | INTEGER (1.. *maxnoofNR-UChannelIDs*, …) | Identifies a portion of the NR-U Channel Bandwidth on which channel access procedure in shared spectrum has been performed in the last reporting period. | - |  |
| >>>>Channel occupancy time percentage DL | M |  | INTEGER (0..100) | The percentage of time for which the channel resources have been utilised for DL traffic served by the corresponding NR-U Channel. Value 100 corresponds to the duration between consecutive reporting. | - |  |
| >>>>Energy Detection Threshold | M |  | INTEGER (-100..-50,…) | Average ED Threshold used for DL channel sensing. Value is in dBm. | - |  |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxCellingNBDU | Maximum no. cells that can be served by a gNB-DU. Value is 512. |
| maxnoofNR-UChannelIDs | Maximum no. NR-U Channel IDs in a cell. Value is 4. |

----------------------------------------------- Next Change ---------------------------------------------------------

#### 9.3.1.10 Served Cell Information

This IE contains cell configuration information of a cell in the gNB-DU.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **IE/Group Name** | **Presence** | **Range** | **IE type and reference** | **Semantics description** | **Criticality** | **Assigned Criticality** |
| NR CGI | M |  | 9.3.1.12 |  | - |  |
| NR PCI | M |  | INTEGER (0..1007) | Physical Cell ID | - |  |
| 5GS TAC | O |  | 9.3.1.29 | 5GS Tracking Area Code | - |  |
| Configured EPS TAC | O |  | 9.3.1.29a |  | - |  |
| **Served PLMNs** |  | *1..<maxnoofBPLMNs>* |  | Broadcast PLMNs in SIB 1 associated to the NR Cell Identity in the *NR CGI* IE | - |  |
| >PLMN Identity | M |  | 9.3.1.14 |  | - |  |
| >TAI Slice Support List | O |  | Slice Support List  9.3.1.37 | Supported S-NSSAIs per PLMN or per SNPN. | YES | ignore |
| >NPN Support Information | O |  | 9.3.1.156 | Supported NPNs per PLMN. | YES | reject |
| >Extended TAI Slice Support List | O |  | Extended Slice Support List  9.3.1.165 | Additional Supported S-NSSAIs per PLMN or per SNPN. | YES | reject |
| CHOICE *NR-Mode-Info* | M |  |  |  | - |  |
| *>FDD* |  |  |  |  | - |  |
| **>>FDD Info** |  | *1* |  |  | - |  |
| >>>UL FreqInfo | M |  | NR Frequency Info  9.3.1.17 | This IE is ignored if the *Cell Direction* IE is included and set to “dl-only”. | - |  |
| >>>DL FreqInfo | M |  | NR Frequency Info  9.3.1.17 | This IE is ignored if the *Cell Direction* IE is included and set to “ul-only”. | - |  |
| >>>UL Transmission Bandwidth | M |  | Transmission Bandwidth  9.3.1.15 | This IE is ignored if the *Cell Direction* IE is included and set to “dl-only”. | - |  |
| >>>DL Transmission Bandwidth | M |  | Transmission Bandwidth  9.3.1.15 | This IE is ignored if the *Cell Direction* IE is included and set to “ul-only”. | - |  |
| >>>UL Carrier List | O |  | NR Carrier List  9.3.1.137 | If included, the *UL Transmission Bandwidth* IE shall be ignored. | YES | ignore |
| >>>DL Carrier List | O |  | NR Carrier List  9.3.1.137 | If included, the *DL Transmission Bandwidth* IE shall be ignored. | YES | ignore |
| *>TDD* |  |  |  |  | - |  |
| **>>TDD Info** |  | *1* |  |  | - |  |
| >>>NR FreqInfo | M |  | NR Frequency Info  9.3.1.17 |  | - |  |
| >>>Transmission Bandwidth | M |  | Transmission Bandwidth  9.3.1.15 |  | - |  |
| >>>Intended TDD DL-UL Configuration | O |  | 9.3.1.89 |  | YES | ignore |
| >>>TDD UL-DL Configuration Common NR | O |  | OCTET STRING | The *tdd-UL-DL-ConfigurationCommon* as defined in TS 38.331 [8] | YES | ignore |
| >>>Carrier List | O |  | NR Carrier List  9.3.1.137 | If included, the Transmission Bandwidth IE shall be ignored. | YES | ignore |
| >NR-U |  |  |  |  | YES | ignore |
| >>NR-U Channel Info List |  | *1..< maxnoofNR-UChannelIDs>* |  |  | - |  |
| >>>NR-U Channel Info Item |  |  |  |  | - |  |
| >>>>NR-U Channel ID | M |  | INTEGER (1.. maxnoofNR-UChannelIDs, …) | Index to uniquely identify the part of the NR-U Channel Bandwidth consisting of a contiguous set of resource blocks (RBs) on which a channel access procedure is performed in shared spectrum.  Value 1 represents the first part of the NR-U Channel Bandwidth on which a channel access procedure is performed. Value 2 represents the second part of the NR-U Channel Bandwidth on which a channel access procedure is performed, and so on. | - |  |
| >>>>NR-U ARFCN | M |  | INTEGER (0.. maxNRARFCN) | It represents the centre frequency of the NR-U Channel Bandwidth for NR bands restricted to operation with shared spectrum channel access, as defined in TS 37.213 [46]. Allowed values are specified in TS 38.101-1 [26] in Table 5.4.2.3-2, Table 5.4.2.3-3 and Table 5.4.2.3-4. | - |  |
| >>>>NR-U Channel Bandwidth | M |  | ENUMERATED (10MHz, 20MHz, 40MHz, 60 MHz, 80 MHz,. …) |  | - |  |
| Measurement Timing Configuration | M |  | OCTET STRING | Contains the *MeasurementTimingConfiguration* inter-node message defined in TS 38.331 [8]. | - |  |
| RANAC | O |  | RAN Area Code  9.3.1.57 |  | YES | ignore |
| **Extended Served PLMNs List** |  | *0..1* |  | This is included if more than 6 Served PLMNs is to be signalled. | YES | ignore |
| **>Extended Served PLMNs Item** |  | *1 ..<maxnoofExtendedBPLMNs>* |  |  | - |  |
| >>PLMN Identity | M |  | 9.3.1.14 |  | - |  |
| >>TAI Slice Support List | O |  | Slice Support List  9.3.1.37 | Supported S-NSSAIs per PLMN or per SNPN. | - |  |
| >>NPN Support Information | O |  | 9.3.1.156 | Supported NPNs per PLMN. | YES | reject |
| >>Extended TAI Slice Support List | O |  | Extended Slice Support List  9.3.1.165 | Additional Supported S-NSSAIs per PLMN or per SNPN. | YES | reject |
| Cell Direction | O |  | 9.3.1.78 |  | YES | ignore |
| **Broadcast PLMN Identity Info List** |  | *0..<maxnoofBPLMNsNR>* |  | This IE corresponds to the *PLMN-IdentityInfoList* IE and the *NPN-IdentityInfoList* IE (if available) in *SIB1* as specified in TS 38.331 [8]. All PLMN Identities and associated information contained in the *PLMN-IdentityInfoList* IE and NPN identities and associated information contained in the *NPN-IdentityInfoList* IE (if available) are included and provided in the same order as broadcast in SIB1.  NOTE: In case of NPN-only cell, the PLMN Identities and associated information contained in the *PLMN-IdentityInfoList* IE are not included. | YES | ignore |
| Cell Type | O |  | 9.3.1.87 |  | YES | ignore |
| >PLMN Identity List | M |  | Available PLMN List  9.3.1.65 | Broadcast PLMN IDs in SIB1 associated to the *NR Cell Identity* IE | - |  |
| >Extended PLMN Identity List | O |  | Extended Available PLMN List  9.3.1.76 |  | - |  |
| >5GS-TAC | O |  | OCTET STRING (3) |  | - |  |
| >NR Cell Identity | M |  | BIT STRING (36) |  | - |  |
| >RANAC | O |  | RAN Area Code  9.3.1.57 |  | - |  |
| >Configured TAC Indication | O |  | 9.3.1.87a | NOTE: This IE is associated with the 5GS TAC in the *Broadcast PLMN Identity Info List* IE | YES | ignore |
| >NPN Broadcast Information | O |  | 9.3.1.157 | If this IE is included the content of the *PLMN Identity List* IE and *Extended PLMN Identity List* IE if present in the *Broadcast PLMN Identity Info List* IE is ignored. | YES | reject |
| Configured TAC Indication | O |  | 9.3.1.87a | NOTE: This IE is associated with the 5GS TAC on top-level of the *Served Cell Information* IE | YES | ignore |
| Aggressor gNB Set ID | O |  | 9.3.1.93 | This IE indicates the associated aggressor gNB Set ID of the cell | YES | ignore |
| Victim gNB Set ID | O |  | 9.3.1.93 | This IE indicates the associated Victim gNB Set ID of the cell | YES | ignore |
| IAB Info IAB-DU | O |  | 9.3.1.106 |  | YES | ignore |
| SSB Positions In Burst | O |  | 9.3.1.138 |  | YES | ignore |
| NR PRACH Configuration | O |  | 9.3.1.139 |  | YES | ignore |
| SFN Offset | O |  | 9.3.1.208 |  | YES | ignore |
| NPN Broadcast Information | O |  | 9.3.1.157 |  | YES | reject |
| Supported MBS FSA ID List |  | *0..<maxnoofMBSFSAs>* |  | Shall contain all MBS Frequency Selection Area Identities associated with the NR CGI. | YES | ignore |
| >MBS Frequency Selection Area Identity | M |  | OCTET STRING(3) |  | – |  |
| RedCap Broadcast Information | O |  | BIT STRING (SIZE(8)) | The presence of this IE indicates that the intraFreqReselectionRedCap IE is broadcast in SIB1 of the corresponding cell, see TS 38.331 [8].  Each position in the bitmap indicates which RedCap UEs are allowed access, according to the setting of RedCap barring indicators in SIB1, see TS 38.331 [8].  First bit = 1Rx, second bit = 2Rx, other bits reserved for future use. Value '1' indicates 'access allowed'. Value '0' indicates 'access not allowed”. | YES | ignore |

|  |  |
| --- | --- |
| Range bound | Explanation |
| maxnoofBPLMNs | Maximum no. of Broadcast PLMN Ids. Value is 6. |
| maxnoofExtendedBPLMNs | Maximum no. of Extended Broadcast PLMN Ids. Value is 6. |
| maxnoofBPLMNsNR | Maximum no. of PLMN Ids.broadcast in an NR cell. Value is 12. |
| maxnoofNR-UChannelIDs | Maximum no. NR-U Channel IDs in a cell. Value is 4. |
| maxnoofMBSFSAs | Maximum no. of MBS FSAs by a cell. Value is 256. |

----------------------------------------------- Start of ASN.1 Changes ---------------------------------------------------------

NR-U-Channel-List ::= SEQUENCE (SIZE (1..maxnoofNR-UChannelIDs)) OF NR-U-Channel-Item

NR-U-Channel-Item ::= SEQUENCE {

nR-U-ChannelID INTEGER(1..maxnoofNR-UChannelIDs),

channelOccupancyTimePercentageDL ChannelOccupancyTimePercentage,

energyDetectionThreshold EnergyDetectionThreshold,

iE-Extensions ProtocolExtensionContainer { { NR-U-Channel-Item-ExtIEs} } OPTIONAL,

...

}

ChannelOccupancyTimePercentage ::= INTEGER (0..100,...)

EnergyDetectionThreshold ::= INTEGER (-100..-50, ...)

----------------------------------------------- End of Changes ---------------------------------------------------------