**3GPP TSG-RAN WG2 Meeting #121 *R2-230XXXX***

**Athens, Greece, 27th February – 3rd March 2023**

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| *CR-Form-v12.2* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
|  | | | | | | | | |
|  | **38.321** | **CR** | **1541** | **rev** | 2 | **Current version:** | **17.3.0** |  |
|  | | | | | | | | |
| *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 | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Corrections for 2-step RA-SDT | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Source to WG:*** | Ericsson, NEC, Huawei | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_SmallData\_INACTIVE-Core | | | | |  | ***Date:*** | | | 2023-02-16 |
|  |  | | | |  | |  | | |  |
| ***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-16 (Release 16) Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)* | |
|  |  | | | | | | | | | |
| ***Reason for change:*** | | IN RA-SDT for 2-step access the UE will transmit UL SDT classified data as part of MsgA. MsgB then contains the RAR message and contention resolution but should also be able to carry DL data to the UE. In the MO-SDT work item this option seems to not have been captured in the MAC specification. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Summary of change:*** | | * Added the DTCH as an option for where the MAC SDU could be sent to the UE. * For the usage of Temporary C-RNTI during contention resolution (when no valid C-RNTI is available), add DTCH as one logical channel in case of RA-SDT.   **Impact Analysis**  Impacted 5G architecture options: NR SA  Impacted functionality:  Small Data Transmission in Inactive. By the approval of this CR it will be possible for the network to send DL data to the UE in MsgB.  Inter-operability:  1. If the network is implemented according to the CR and the UE is not, there are inter-operability issues.  2. If the UE is implemented according to the CR and the network is not, there are inter-operability issues. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Consequences if not approved:*** | | MsgB can’t be used to deliver DL data to the UE during a 2-step RA-SDT procedure. DL SDT data cannot be transmitted in Msg4 as response of the initial UL transmission of RA-SDT. | | | | | | | | |
|  | |  | | | | | | | | |
| ***Clauses affected:*** | | 6.1.5a  7.1 | | | | | | | | |
|  | |  | | | | | | | | |
|  | | **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:*** | |  | | | | | | | | |

FIRST CHANGE

### 6.1.5a MAC PDU (MSGB)

A MAC PDU consists of one or more MAC subPDUs and optionally padding. Each MAC subPDU consists one of the following:

- a MAC subheader with Backoff Indicator only;

- a MAC subheader and fallbackRAR;

- a MAC subheader and successRAR;

- a MAC subheader and MAC SDU for CCCH, DCCH or DTCH;

- a MAC subheader and padding.

A MAC subheader with Backoff Indicator consists of five header fields E/T1/T2/R/BI as described in Figure 6.1.5a-1. A MAC subPDU with Backoff Indicator only is placed at the beginning of the MAC PDU, if included.

A MAC subheader for fallbackRAR consists of three header fields E/T1/RAPID as described in Figure 6.1.5a-2. A MAC subheader for successRAR consists of eight header fields E/T1/T2/S/R/R/R/R as described in Figure 6.1.5a-3. A MAC subheader for MAC SDU consists of the four header fields R/F/LCID/L as described in Figure 6.1.2-1 and Figure 6.1.2-2.

At most one 'MAC subPDU for successRAR' indicating presence of 'MAC subPDU(s) for MAC SDU' is included in a MAC PDU. MAC subPDU(s) for MAC SDU are placed immediately after the 'MAC subPDU for successRAR' indicating presence of 'MAC subPDU(s) for MAC SDU'.

If MAC PDU includes MAC subPDU(s) for MAC SDU, the last MAC subPDU for MAC SDU is placed before MAC subPDU with padding as depicted in Figure 6.1.5a-4. Otherwise, the last MAC subPDU in MAC PDU is placed before padding as depicted in Figure 6.1.5a-5. The MAC subPDU with padding includes R/R/LCID MAC subheader as described in Figure 6.1.2-3 and padding. The size of padding in the MAC subPDU with padding can be zero. The length of padding is implicit based on TB size, size of MAC subPDU(s).

END OF FIRST CHANGE

SECOND CHANGE

7.1 RNTI values

RNTI values are presented in Table 7.1-1.

**Table 7.1-1: RNTI values.**

|  |  |
| --- | --- |
| **Value (hexa-decimal)** | **RNTI** |
| 0000 | N/A |
| 0001–FFF2 | RA-RNTI, MSGB-RNTI, Temporary C-RNTI, C-RNTI, CI-RNTI, MCS-C-RNTI, CS-RNTI, TPC-PUCCH-RNTI, TPC-PUSCH-RNTI, TPC-SRS-RNTI, INT-RNTI, SFI-RNTI, SP-CSI-RNTI, PS-RNTI, SL-RNTI, SLCS-RNTI SL Semi-Persistent Scheduling V-RNTI, AI-RNTI, G-RNTI, G-CS-RNTI, and CG-SDT-CS-RNTI |
| FFF3–FFFB | Reserved |
| FFFC | PEI-RNTI |
| FFFD | MCCH-RNTI |
| FFFE | P-RNTI |
| FFFF | SI-RNTI |

**Table 7.1-2: RNTI usage.**

|  |  |  |  |
| --- | --- | --- | --- |
| **RNTI** | **Usage** | **Transport Channel** | **Logical Channel** |
| P-RNTI | Paging and System Information change notification | PCH | PCCH |
| SI-RNTI | Broadcast of System Information | DL-SCH | BCCH |
| RA-RNTI | Random Access Response | DL-SCH | N/A |
| MSGB-RNTI | Random Access Response for 2-step RA type | DL-SCH | CCCH, DCCH, DTCH |
| Temporary C-RNTI | Contention Resolution (when no valid C-RNTI is available) | DL-SCH | CCCH, DCCH, DTCH |
| Temporary C-RNTI | Msg3 transmission | UL-SCH | CCCH, DCCH, DTCH |
| C-RNTI, MCS-C-RNTI | Dynamically scheduled unicast transmission | UL-SCH | DCCH, DTCH |
| C-RNTI | Dynamically scheduled unicast transmission | DL-SCH | CCCH, DCCH, DTCH |
| MCS-C-RNTI | Dynamically scheduled unicast transmission | DL-SCH | DCCH, DTCH |
| C-RNTI | Triggering of PDCCH ordered random access | N/A | N/A |
| C-RNTI | Dynamically scheduled PTP retransmission for initial PTM transmission for multicast MBS. | DL-SCH | MTCH |
| CG-SDT-CS-RNTI | Dynamically scheduled unicast transmission  (retransmission) | UL-SCH | CCCH, DCCH, DTCH |
| CS-RNTI | Configured scheduled unicast transmission (activation, reactivation and retransmission) | DL-SCH, UL-SCH | DCCH, DTCH |
| CS-RNTI | Configured scheduled unicast transmission (deactivation) | N/A | N/A |
| CS-RNTI | Configured scheduled unicast transmission (PTP retransmission for initial PTM transmission) | DL-SCH | MTCH |
| CS-RNTI | Configured scheduled unicast transmission (MBS SPS deactivation) | N/A | N/A |
| G-CS-RNTI | Configured scheduled multicast transmission (activation, reactivation and retransmission) | DL-SCH | MTCH |
| G-CS-RNTI | Configured scheduled multicast transmission (deactivation) | N/A | N/A |
| TPC-PUCCH-RNTI | PUCCH power control | N/A | N/A |
| TPC-PUSCH-RNTI | PUSCH power control | N/A | N/A |
| TPC-SRS-RNTI | SRS trigger and power control | N/A | N/A |
| INT-RNTI | Indication pre-emption in DL | N/A | N/A |
| SFI-RNTI | Slot Format Indication on the given cell | N/A | N/A |
| SP-CSI-RNTI | Activation of Semi-persistent CSI reporting on PUSCH | N/A | N/A |
| CI-RNTI | Cancellation indication in UL | N/A | N/A |
| PS-RNTI | DCP to indicate whether to start *drx-onDurationTimer* for associated DRX cycle | N/A | N/A |
| SL-RNTI | Dynamically scheduled sidelink transmission | SL-SCH | SCCH, STCH |
| SLCS-RNTI | Configured scheduled sidelink transmission (activation, reactivation and retransmission) | SL-SCH | SCCH, STCH |
| SLCS-RNTI | Configured scheduled sidelink transmission (deactivation) | N/A | N/A |
| SL Semi-Persistent Scheduling V-RNTI (NOTE 2) | Semi-Persistently scheduled sidelink transmission for V2X sidelink communication  (activation, reactivation and retransmission) | SL-SCH | STCH |
| SL Semi-Persistent Scheduling V-RNTI  (NOTE 2) | Semi-Persistently scheduled sidelink transmission for V2X sidelink communication  (deactivation) | N/A | N/A |
| AI-RNTI | Availability indication on the given cell | N/A | N/A |
| G-RNTI | Dynamically scheduled MBS PTM transmission | DL-SCH | MTCH |
| MCCH-RNTI | Dynamically scheduled MCCH signalling and MCCH change notification | DL-SCH | MCCH |
| PEI-RNTI | Paging Early Indication | N/A | N/A |
| NOTE 1: The usage of MCS-C-RNTI is equivalent to that of C-RNTI in MAC procedures (except for the C-RNTI MAC CE).  NOTE 2: The MAC entity uses SL Semi-Persistent Scheduling V-RNTI to control semi-persistently scheduled sidelink transmission on SL-SCH for V2X sidelink communication as specified in clause 5.14.1.1 of TS 36.321 [22].  NOTE 3: The usage of CG-SDT-CS-RNTI is equivalent to that of CS-RNTI when there is an CG-SDT procedure ongoing. | | | |

END OF SECOND CHANGE