**3GPP TSG-RAN2 Meeting #115eR2-210**

**Electronic, 9th– 27th August, 2021**

**Source: Email discussion Rapporteur (Huawei, HiSilicon)**

**Title: Summary of [Post114-e][506][SData] Running MAC CR review issue list**

**Agenda item:** **8.6.1**

**Document for:** **Discussion and Decision**

This document contains the list of comments made during the review of the MAC CR for SDT in the email discussion [Post114-e][506][SData] Running MAC CR.

For the issue found in the draft CR under Please fill in the form according to the following:

* On the column of index, fill in an index with the company initial letter + discussion number + issue number by increasing order.
  + For example, for the discussion in Post114ePhaseI, for an issue from Huawei, HiSilicon, one can fill in “H (company initial letter) + 0 (discussion number for Post114e)+ 00 (Issue number)”=> H000
  + Please use 0 for Post114e-PhaseI
* On the column of brief description of the issue, as the name suggests, please give a description on the issue
* On the column of suggested change/company comment, please give the proposed change on the draft spec based on the description on the issue. Companies can also give comments on the proposed change in this column by adding a marking of [Company] in this column
* On the column of proposed way forward by rapporteur, please leave it empty at the time of email discussion. At the conclusion of the discussion, email discussion rapporteur would give a way forward according to the inputs from different companies on the issue.

On the section of “Any Other Clause”, if a certain issue is found under a Clause in the spec that has not been listed, please fill the issue in the form under this section.

Please edit the document in draft view (View -> Draft) to view the entire table.

# Post114e-Phase I

## 3.2 Definitions

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| # | Brief description of the issue | Suggested change/company comments | Proposed way forward by rapporteur |
| Z000 | CG-SDT Configured Grant type 1-based Small Data Transmission  Since SDT is also defined separately, we could avoid using the full expansion and use the SDT abbreviation here already. | CG-SDT Configured Grant type 1-based ~~Small Data Transmission~~ SDT |  |
| Z001 | Same as Z000 for RA-SDT | RA-SDT Random Access-based ~~Small Data Transmission~~ SDT |  |

### 5.1.1 Random Access procedure initialization

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z002 | *prach-ConfigurationIndex*  These are also applicable to Msg1 in 4-step RA-SDT type if the PRACH occasions are shared between 4-step RA type and 4-step RA-SDT type. These are also applicable to the Random Access Preamble for MSGA in 2-step RA-SDT type if the PRACH occasions are shared between 4-step RA type and 2-step RA-SDT type  General Comment: Do we really need to define new 4-step-RA-SDT type? With the above sentence, it seems we need to define “*4-step RA-SDT type*” and “2-step RA-SDT type”. However, since the RA type itself is not changed due to introduction of SDT. We could refer to existing RA types with and without SDT. Please see the suggested rewording.  On the other hand if we do define a new RA type, perhaps this needs to be defined (e.g. in stage-2) etc. Also there will be other changes needed in MAC spec in other sections too in this case since we use checks such as “if *RA\_TYPE* is set to *2-stepRA*” etc elsewhere and we need to now redefine all these with new RA types etc. It would be preferable to avoid a new RA type if possible to avoid such changes. | - *prach-ConfigurationIndex*: the available set of PRACH occasions for the transmission of the Random Access Preamble for Msg1. These are also applicable to Msg1 for RA-SDT if the PRACH occasions are shared between Random Access procedures with and without SDT for 4-step RA type.  These are also applicable to the MSGA PRACH if the PRACH occasions are shared between 2-step and 4-step RA types. These are also applicable to MSGA PRACH for RA-SDT if the PRACH occasions are shared between 4-step RA type and 2-step RA type with SDT. |  |
| Z003 | *msgA-PRACH-ConfigurationIndex*  Similar comment as Z002 (please see the corresponding suggestion). Further, it is not clear why these occasions should be shared with MSG1 in 4-step RA type with SDT as defined in the new definition. In case of shared occasions between 2-step and 4-step, these should be signalled via prach-CongurationIndex-SDT. | - *msgA-PRACH-ConfigurationIndex*: the available set of PRACH occasions for the transmission of the Random Access Preamble for MSGA in 2-step RA type. These are also applicable to MSGA PRACH for RA-SDT if the PRACH occasions are shared between Random Access procedures with and without SDT for 2-step RA type. |  |
| Z004 | *prach-ConfigurationIndex-SDT and msgA-PRACH-ConfigurationIndex-SDT*  Similar comment as Z002 | - *prach-ConfigurationIndex-SDT*:the available set of PRACH occasions for the transmission of the Random Aceess Preamble for Msg1 in 4-step RA type with SDT;  - *msgA-PRACH-ConfigurationIndex-SDT*: the available set of PRACH occasions for the transmission of the Random Access Preamble for MSGA in 2-step RA type with SDT;  - *sdt-MSGA-RSRP-Threshold*: an RSRP threshold for selection between 2-step RA type with SDT and 4-step RA type with SDT when both 2-step and 4-step RA type Random Access Resources for SDT are configured in the UL BWP; |  |
| Z005 | Similar comments as Z002 apply also to the definitions of groupB-Configured-SDT and *groupB-ConfiguredTwoStepRA-SDT* |  |  |
| Z006 | 1> if the Serving Cell for the Random Access procedure is configured with supplementary uplink as specified in TS 38.331 [5]:  2> if the Random Access procedure was initiated for Small Data Transmission as specified in clause 5.x:  3> set the *PCMAX* to PCMAX,f,c of the selected UL carrier.  2> else if the RSRP of the downlink pathloss reference is less than *rsrp-ThresholdSSB-SUL*:  3> select the SUL carrier for performing Random Access procedure;  3> set the *PCMAX* to PCMAX,f,c of the SUL carrier.  2> else:  3> select the NUL carrier for performing Random Access procedure;  3> set the *PCMAX* to PCMAX,f,c of the NUL carrier.  Comment: It seems we could simplify the changes a bit by existing condition about signalled carrier… Please see the proposed alternative. Both can work though, so no strong view. | 1> if the carrier to use for the Random Access procedure is explicitly signalled or determined as specified in subclause 5.x for SDT:  2> select the signalled or determined carrier for performing Random Access procedure;  2> set the *PCMAX* to PCMAX,f,c of the selected carrier.  1> else if the carrier to use for the Random Access procedure is not explicitly signalled; and  1> if the Serving Cell for the Random Access procedure is configured with supplementary uplink as specified in TS 38.331 [5]; and  1> if the RSRP of the downlink pathloss reference is less than *rsrp-ThresholdSSB-SUL*:  2> select the SUL carrier for performing Random Access procedure;  2> set the *PCMAX* to PCMAX,f,c of the SUL carrier.  1> else:  2> select the NUL carrier for performing Random Access procedure;  2> set the *PCMAX* to PCMAX,f,c of the NUL carrier. |  |
| Z100 | General comment to section 5.1.1:  A number of changes to this section will likely overlap with similar changes coming from other WIs that require RACH partitioning. We need to understand how we could integrate these changes. For instance, the statements such as “These are also applicable to Msg1 for RA-SDT if the PRACH occasions are shared between Random Access procedures with and without SDT for 4-step RA type” etc which exist in this section may not be exclusive to this WI. i.e. these preambles or ROs may also be shared by other features requiring the RACH partitioning and such statement above may need to be updated to cover all such cases. We hence need a general discussion on how to combine these features. Perhaps we could even have to think about a common MAC CR for overlapping WIs in this case. Something we need to discuss further at the next meeting. |  |  |

### 5.1.1a Initialization of variables specific to Random Access type

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.2 Random Access Resource selection

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z007 | 1> else if an SSB is selected above:  2> if the selected RA type is set to *4-stepRA-SDT*:  3> determine the next available PRACH occasion from the PRACH occasions corresponding to the selected SSB (the MAC entity shall select a PRACH occasion randomly with equal probability amongst the consecutive PRACH occasions according to clause 8.1 of TS 38.213 [6], corresponding to the selected SSB).  2> else:  3> determine the next available PRACH occasion from the PRACH occasions corresponding to the selected SSB permitted by the restrictions given by the *ra-ssb-OccasionMaskIndex* if configured or indicated by PDCCH (the MAC entity shall select a PRACH occasion randomly with equal probability amongst the consecutive PRACH occasions according to clause 8.1 of TS 38.213 [6], corresponding to the selected SSB; the MAC entity may take into account the possible occurrence of measurement gaps when determining the next available PRACH occasion corresponding to the selected SSB).  Comment: It is unclear why the highlighted part is needed. Isn’t the existing text sufficient? | Delete the newly added text |  |
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### 5.1.2a Random Access Resource selection for 2-step RA type

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z008 | 1> if the selected RA type is set to *2-stepRA-SDT*:  2> determine the next available PRACH occasion from the PRACH occasions corresponding to the selected SSB (the MAC entity shall select a PRACH occasion randomly with equal probability amongst the consecutive PRACH occasions according to clause 8.1 of TS 38.213 [6], corresponding to the selected SSB).  1> else:  Same comment as Z007 |  |  |
| Z101 | NOTE1: Based on the agreement in RAN2#113bis-e: “Switching from SDT to non-SDT is supported”.  The agreement “switching from SDT to non-SDT is supported” doesn’t mean we will support fallback from SDT RACH resource to non-SDT RACH resource within one RACH procedure or PRACH retransmission attempt. The switching can be triggered e.g. by either a DCCH message or new CCCH procedure (FFS) and may also be triggered by network (e.g. by sending RRCResume etc). So, we are not sure if we need changes in this section and this note can be deleted. |  |  |

### 5.1.3 Random Access Preamble transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.3a MSGA transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L000 | We don't understand why "or for Scheduling Request in Small Data Transmission in clause 5.x" is included. | [LG] Remove the sentence |  |
| Z009 | We agree with L000 comment |  |  |
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### 5.1.4a MSGB reception and contention resolution for 2-step random access

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.5 Contention Resolution

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.1.6 Completion of the Random Access procedure

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.2 Maintenance of Uplink Time Alignment

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z010 | 1> when the *cg-SDT-TimeAlignmentTimer* expires:  2> notify RRC to release configured grant type 1 configuration(s) for Small Data Transmission.  The notification should only be that the CG-TAT has expired or not running etc. In RRC the actions can be taken based on this indication (e.g. release the CG resources at the next RRC Resume or release it if there is an ongoing SDT etc)… | 1> when the *cg-SDT-TimeAlignmentTimer* expires:  2> notify RRC that the *cg-SDT-TimeAlignmentTimer* has expired. |  |
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### 5.3.1 DL Assignment reception

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.3.2.1 HARQ Entity

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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5.3.2.2 HARQ process

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z102 | 1> if the *timeAlignmentTimer*, associated with the TAG containing the Serving Cell on which the HARQ feedback is to be transmitted, is stopped or expired, and;  1> if the transmission for the HARQ process is initiated for CG-SDTand *cg-SDT-TimeAlignmentTimer* is stopped or expired:  Comment: The interaction between the regular TAT and the cg-SDT-TimeAlignmentTimer is a bit unclear from the above.  i.e.:  - Is the UE considered to be time aligned only if both TAT and the cg-SDT-TimeAlignmentTimer are both running? The “and” in the above seems to suggest this but this is probably not the common understanding.  - Also, if the above is true then we also need to understand the interaction between TAC and the cg-SDT-TimeAlignmentTimer.  Further, the following agreement is not yet implemented:  5. TAT-SDT is started upon receiving the TAT-SDT configuration from gNB, i.e. RRCrelease message, and can be (re)started upon reception of TA command.  Assuming that the CG-SDT-TAT can be restarted upon TA command, there seems to be no need for checking both regular TAT and CG-SDT-TAT for CG-SDT transmissions?? |  |  |

### 5.4.1 UL Grant reception

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.4.2.1 HARQ Entity

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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#### 5.4.2.2 HARQ process

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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### 5.4.4 Scheduling Request

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z011 | For a logical channel serving a radio bearer configured with SDT, no PUCCH resource for SR is configured.  Comment: The above sentence is not needed and seems not correct in any case. Note that the RB will be the same in connected mode too (and in connected mode, the RB may be configured with SR resources). | Delete the sentence “For a logical channel serving a radio bearer configured with SDT, no PUCCH resource for SR is configured.” |  |

### 5.8.2 Uplink

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z012 | When CG-SDT is triggered, the MAC entity shall:  1> if at least one of the SSBs with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB* is available:  2> select an SSB with SS-RSRP above *cg-SDT-RSRP-ThresholdSSB*;  2> select the configured grant type 1 configuration on BWP of the selected UL carrier associated with the selected SSB;  2> select the CG occasion corresponding to the selected SSB and the selected configured grant type 1 configuration.  1> else if RA-SDT is configured:  2> initiate Random Access procedure on the selected UL carrier for Small Data Transmission according to clause 5.1;  1> else:  2> initiate Random Access procedure in clause 5.1 for CCCH logical channel (i.e., not for Small Data Transmission).  Comment: Firstly, switching between CG-SDT and RA-SDT has not yet been agreed. We only agreed that if none of the SSBs are above the threshold for initial CG transmission, then UE is not allowed to select any SSB. Instead, UE will select RA-SDT directly before transmitting the first initial message. However, since the initial UL message has not yet been sent, this doesn’t constitute a switching from CG-SDT to RA-SDT. For the subsequent CG transmissions, we need further discussion on how to handle the transmissions/retransmissions. So, for this change, we will likely need separate description for the initial CG-SDT transmission and the subsequent data transmission with CG resource during CG SDT.  For the initial SDT type selection, I guess we can have a separate section (e.g. 5.x) instead of the section for CG transmission.  For the subsequent data transmission with CG, I guess the SSB quality check can be captured in section 5.4.1 UL Grant reception (e.g. only deliver the UL grant to HARQ process in case the RSRP of the SSB associated to the UL grant is qualified). The understanding is that if there is no UL grant then RACH will be triggered (but this is normal RACH, not RA-SDT). |  |  |

## 5.14 Handling of measurement gaps

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.15 Bandwidth Part (BWP) operation

### 5.15.1 Downlink and Uplink

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.16 SUL operation

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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## 5.x Small Data Transmission

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L001 | The selection of BWP configured for SDT should be considered on SDT procedure. This is because a separate BWP for SDT can be configured, and we think it is also possible to configure multiple separate BWPs for SDT. | [LG] BWP switching from initial BWP to separate BWP for SDT should be considered when SDT procedure is initiated. BWP switching amongst separate BWPs configured for SDT is also considered. |  |
| Z014 | General comment:  Replace all occurrences of Small Data Transmission with SDT (except in the subclause heading). | Replace all occurrences of Small Data Transmission with SDT. |  |
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## 5.x.1 Validation for Small Data Transmission using CG

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| L002 | The expression "the time alignment value for SDT using CG type 1 to be valid " is not familiar. | [LG] The Text could be changed to  " The MAC entity shall consider CG-SDT resource is valid when the following conditions are fulfilled:" |  |
| L003 | TA timer should also be considered for validation for CG-SDT. | [LG] Add "1> cg-SDT-TimeAlignmentTimer is configured and running;" |  |
| Z016 | For L003, please also see our comment above in Z102. To us it seems more discussion is needed to understand how the normal TA and the CG-SDT-TAT interact. |  |  |

### 6.1.5a MAC PDU (MSGB)

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
| Z017 | - a MAC subheader and MAC SDU for CCCH or DCCH or DTCH;  Comment: Why was the DTCH added here. i.e. which agreement is this based on? Our understanding is that we did not agree any changes to MSGB format. | Remove the DTCH |  |

## Any Other Clause

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| # | Brief description of the issue | Suggested resolution/company comments | Proposed way forward by rapporteur |
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