3GPP TSG-RAN WG1 Meeting #108-e Draft R1-2202533

e-Meeting, 21st February – 3rd March 2022

Agenda Item: 8.6

Title: FL summary on RAN1 RRC parameter list for Rel-17 NR RedCap

Source: Moderator (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This feature lead (FL) summary (FLS) concerns the following email discussion for the Rel-17 work item (WI) for support of reduced capability (RedCap) NR devices [1].

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| [108-e-R17-RRC-RedCap] Email discussion on Rel-17 RRC parameters for RedCap – Johan (Ericsson)   * 1st check point for first LS in [108-e-R17-RRC]: February 24 * Final check point for second LS in [108-e-R17-RRC] if necessary: March 3 |

The FLS for the RAN1#107-e discussion on the RedCap RRC parameter list can be found in [2] and the resulting draft RedCap RRC parameter list is available in [3]. The FLS for the following discussion on the overall RRC parameter list is in [4] and the resulting RRC parameter list in [5]. For recommendations on RRC parameter list preparation, see [6]. Earlier RAN1 agreements for RedCap are summarized in [7].

The issues that are in the focus of this round of the discussion are tagged FL3.

Follow the naming convention in this example:

* *RedCapParamFLS-v000.docx*
* *RedCapParamFLS-v001-CompanyA.docx*
* *RedCapParamFLS-v002-CompanyA-CompanyB.docx*
* *RedCapParamFLS-v003-CompanyB-CompanyC.docx*

If needed, you may “lock” a spreadsheet file for 30 minutes by creating a checkout file, as in this example:

* Assume CompanyC wants to update *RedCapParamFLS-v002-CompanyA-CompanyB.docx*.
* CompanyC uploads an empty file named *RedCapParamFLS-v003-CompanyB-CompanyC.checkout*
* CompanyC checks that no one else has created a checkout file simultaneously, and if there is a collision, CompanyC tries to coordinate with the company who made the other checkout (see, e.g., contact list below).
* CompanyC then has 30 minutes to upload *RedCapParamFLS-v003-CompanyB-CompanyC.docx*
* If no update is uploaded in 30 minutes, other companies can ignore the checkout file.
* Note that the file timestamps on the server are in UTC time.

In file names, please use the hyphen character (not the underline character) and include ‘v’ in front of the version number, as in the examples above and in line with the general recommendation (see slide 10 in [R1-2200852](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_108-e/Docs/R1-2200852.zip)), otherwise the sorting of the files will be messed up (which can only be fixed by the RAN1 secretary).

To avoid excessive email load on the RAN1 email reflector, please note that there is NO need to send an info email to the reflector just to inform that you have uploaded a new version of this document. Companies are invited to enter the contact info in the table below.

**FL2 Question 1-1a: Please consider entering contact info below for the points of contact for this email discussion.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Point of contact** | **Email address** |
| Intel | Debdeep Chatterjee | debdeep.chatterjee@intel.com |
| CATT | Yongqiang FEI | feiyongqiang@catt.cn |
| Spreadtrum | Huayu Zhou | huayu.zhou@unisoc.com |
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| LGE | Jay KIM | jaehyung.kim@lge.com |
| ZTE | Youjun Hu | hu.youjun1@zte.com.cn |
| Samsung | Feifei Sun | Feifei.sun@samsung.com |
| Qualcomm | Jing Lei | leijing@qti.qualcomm.com |

# 2 Initial round

**FL1 Question 2-1a: Companies are invited to comment on parameters in** [***RedCapParamList-v000***](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_108-e/Inbox/drafts/8.6/ParamList/RedCapParamList-v000.xlsx)**.**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Intel | We are wondering if the details of the following configurations can be discussed here or as part of AI 8.6.1.1:   * Details of NCD-SSB following the feedback from RAN2/RAN4. * Details of configuration of CORESET in separate initial DL BWP. |
| CATT | For [RedCap-specific initial DL BWP configuration], it may be updated based on the outcome of the AI 8.6.1.1, for the case when legacy initial DL BWP is larger than the maximum RedCap BW, then whether “separate initial DL BWP must be configured“ or “separate initial DL BWP may or may not be configured, if not, continue reusing CORESET#0“. |
| Spreadtrum | The descriptions of the separat initial DL BWP may be updated. |
| FUTUREWEI | a. The description of [RedCap-specific initial DL BWP configuration] may need to be updated to reflect agreements in 8.6.1.1 (e.g. agreement of some variation of 2-1)  b. The description of [Common PUCCH configuration for RedCap-specific initial UL BWP] and values (which are FFS) may need to be updated to reflect agreements in 8.6.1.1 |
| vivo | We have similar question as Intel, how to capture the RRC parameters relatd to NCD-SSB configurations, e.g. periodicity, power, PositionsInBurst, and potentially time offset, etc, should we wait for RAN2 or should we make them complete as much as possible in AI 8.6.1.1 so that we do not miss the deadline for introducing new RRC parameters.  Regarding initial DL BWP configuration, we agree with CATT/Spreadtrum/FUTUREWEI that the decription may need to be updated based on the outcome of ongoing discussion (i.e. whether the seperate initial DL BWP shall be always configured) |
| Huawei, HiSilicon | * We share the feeling of Intel and vivo and agree with CATT/SPD/FW. * For PUCCH, after more detials are stable, candidate values agreed there can be captured. However, it seems how to mapping the sides is still pending clarification as Docomo commented in 8.6.1.1 and FFS in the excel list. We think it is possible just the IE of row7 for joint signaling the 3 states with one more state reserved, for future use. That is, for *[Intra-slot PUCCH frequency hopping within RedCap-specific initial UL BWP enabled/disabled]*, the ‚‘value range‘ can be modified as {Enabled, DisabledLowerEdge, DisabledUpperEdge}. |
| LGE | We agree with most of the comments above that the descriptions of [RedCap-specific initial DL BWP configuration] and [Common PUCCH configuration for RedCap-specific initial UL BWP] need to be updated along with the agreements to be made in AI 8.6.1.1.  Especially for the [Common PUCCH configuration for RedCap-specific initial UL BWP], it may need to be divided into a few parameters including e.g., additional PRB offset and upper/lower edge indication. |
| Intel2 | We’d like to take this opportunity to clarify our earlier comment on CORESET configuration:  Details of configuration of CORESET in separate initial DL BWP.  This is referring to the details of how the CORESET in separate initial DL BWP is to be configured in SIB1 – if can be sigalled like any other CORESET or should follow CORESET#0 signalling mechanisms (using up to 4 bits), etc.  We think this information still needs to be conveyed to RAN2. |
| ZTE, Sanechips | We agree to make some modifications for the descriptions of [RedCap-specific initial DL BWP configuration] and [Common PUCCH configuration for RedCap-specific initial UL BWP]. For the NCD-SSB, seems we did not introduce any new parameters in RAN1. Maybe RAN2 would decide the related parameter if new function is introduced. |
| FL2 | **Question 2-1b:**   * **Companies are invited to comment on parameters in** [***RedCapParamList-v001***](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_108-e/Inbox/drafts/8.6/ParamList/RedCapParamList-v001.xlsx)**.** |
| Samsung | Fine with the newly added NCD-SSB configuration, detail can be left to RAN 2.  Support Intel’s comment on the signaling of CORESET in separate iDL BWP. In our view, other CORESET like is enough. |
| LGE | Okay with most of the updates.  Just a minor comment on the value range of the additional PRB offset which is {0, 2, 3, 4, 6, 8, 9, 10, 12}. We wonder if the 0 needs to be included in the value range when there is 0 in the column called Default value aspect.  Regarding the question from Intel on the CORESET configuration in the separate initial DL BWP, we slightly prefer to signal it as any other CORESET for flexibility. |
| CMCC | Fine with the newly added parameters. And for the description of *RedCap-specific initial DL BWP configuration,* we share similar view with other companies that it may further be updated depending on the outcome of discussion in AI 8.6.1.1, in case that CORESET#0 can be reused as initial DL BWP when the initial DL BWP for non-RedCap UEs is wider than the maximum RedCap UE bandwidth. |
| Huawei, HiSilicon | * We understand the NCD-SSB is configured after RRC connected mode however it still be possible in a cell specific manner? * We think it is possible to joint configure PUCCH FH and the mapping sides, by combining the parameter in Row8 and Row11 ‚ with‘value range‘ modified as {Enabled, DisabledLowerEdge, DisabledUpperEdge}. The potential benefit is there could be one state reserved within 2-bit indication, for potential future use e.g. mapping to two sides. Since we are lack of discussion and signalling can be up to RAN2, we think at least a note can be captured in both Row8 and Row11:   **RAN1 has not discussed the singalling details e.g. whether to joint signal the configuration of PUCCH FH and mapping sides, which can be up to RAN2.** |
| FUTUREWEI2 | For the description of "RedCap-specific initial DL BWP configuration", the sentence " When the parameter is not present, RedCap UEs use the same SIB-configured initial DL BWP as non-RedCap UEs if it does not exceed the RedCap UE maximum bandwidth" is not in line with 8.6.1.1. discussions.  For the note /description of "RedCap-specific PUCCH resource set index", should it be stated that it can be a different than the legacy parameter pucch-ResourceCommon?  In the underlying agreement for "Additional PRB offset for common PUCCH configuration for RedCap-specific initial UL BWP", the value of 0 is used if the parameter is not configured. The value of 0 was not agreed as part of the list. |
| Intel3 | Thanks for the updates!  One follow-up question on NCD-SSB: we understand that details on PCID/sequence use, QCL association, and periodicity are somewhat clear from RAN2/RAN4 feedback. However, we still have some details that is not clear if they are obvious to all:   * Frequency location for NCD-SSB to avoid false detection? * Time offsets beween CD-SSB and NCD-SSB? * UE assumption on Tx power for NCD-SSB?   Also, on CORESET configuration in separate initial DL BWP, it would be good to add a note to capture this as part of separate initial DL BWP configuration. We assume that a maximum of one CORESET may be configured – we are fine with using the regular CORESET configuration mechanism (as against limiting to 4 bits) for increased flexibiliy as pointed by Samsung and LGE. |
| FL3 | The draft parameter list has been updated based on the received responses.  Two responses questioned whether the value 0 needs to be included in the value range for the parameter for ‘Additional PRB offset for common PUCCH configuration for RedCap-specific initial UL BWP’ in column K when it is indicated as the default value in column L. The parameter list has now been updated to remove the value 0 from the value range. Note that this may mean that the RAN1 specification (38.213) needs to specify that an additional PRB offset of 0 should be assumed when higher layers do not provide a value.  Some responses asked whether the parameter list could or should describe more NCD-SSB configuration aspects. The updated parameter list covers some NCD-SSB related RAN1 agreements and a note that other agreements regarding NCD-SSB configuration can be found in the RAN1/2/4 LS exchange ([R1-2112802](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_107-e/Docs/R1-2112802.zip), [R1-2200876](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_108-e/Docs/R1-2200876.zip), [R1-2200898](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_108-e/Docs/R1-2200898.zip), [R1-2200904](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_108-e/Docs/R1-2200904.zip)) and RAN2/4 agreements.  One response suggested that NCD-SSB could be configured in a cell-specific manner rather than a UE-specific manner even if it is only configured and used in connected mode. However, the guidelines on slide 16 in [6] state that column N should be set to cell-specific only if the parameter is required during initial access or in idle/inactive mode.  **Question 2-1c:**   * **Companies are invited to comment on parameters in** [***RedCapParamList-v002***](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_108-e/Inbox/drafts/8.6/ParamList/RedCapParamList-v002.xlsx)**.** |
| Qualcomm | * Regarding PRB mapping for common PUCCH configuration of RedCap UE, we think the value range descriptios of {FromLowerEdge, FromUpperEdge} are not accurate for certain initial UL BWP size and PRB offset size.   Therefore, we think the value range can be updated by {Equaltion1, Equation2}, wherein Equaltion 1 and 2 refer to the first and the second equation in the following agreements of AI 8.6.1.1: |
| LGE | Thanks for updating the list. We are generally fine with the update.  Regarding Qualcomm’s suggestion on changing from {FromLowerEdge, FromUpperEdge} to {Equaltion1, Equation2}, I’m not sure if it is intended to be captured as it is or not, but I think it should be okay as it is because it says the mapping starts from lower or upper edge, which is true, and it doesn't say it stays at the lower or upper edge per say. And it is more intuitive than saying eq1 and eq2. |
| Huawei,HiSilicon | We share similar view as Qualcomm.  Actually, the parameter of equation indication is only needed when frequency hopping is disabled, and the parameter of equation indication should be optional.  We propose by modifying {Enabled, Disabled} in Row8 with {Equation1, Equation2}, and take FH as the default, and avoid using another extra parameter to indicate enabling/disabling. By the way there is no agreement saying there should be a separate IE for that purpose – which should be up to RAN2 and not be implied by the RRC list we send to them. |

# References

1. [RP-211574](https://www.3gpp.org/ftp/TSG_RAN/TSG_RAN/TSGR_92e/Docs/RP-211574.zip), “Revised WID on support of reduced capability NR devices”, Ericsson

1. [R1-2112504](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_107-e/Docs/R1-2112504.zip), “FL summary on RAN1 RRC parameter list for Rel-17 NR RedCap”, Moderator (Ericsson)

1. [R1-2112505](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_107-e/Docs/R1-2112505.zip), “Draft RAN1 RRC parameter list for Rel-17 NR RedCap”, Moderator (Ericsson)

1. [R1-2112978](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_107-e/Docs/R1-2112978.zip), “Summary of Email discussion on Rel-17 RRC parameters for LS to RAN2”, Moderator (Ericsson)

1. [R1-2112979](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_107-e/Docs/R1-2112979.zip), “Collection of higher layers parameter list for Rel-17 LTE and NR”, Moderator (Ericsson)

1. [R1-2111193](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_107-e/Docs/R1-2111193.zip), “Recommendations for RAN1 RRC Parameter Preparation”, Moderator (Ericsson)

1. [R1-2112506](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_107-e/Docs/R1-2112506.zip), “RAN1 agreements for Rel-17 NR RedCap”, Rapporteur (Ericsson)