3GPP TSG-RAN WG2 #118-e draft R2-2206193

Electronical meeting, 9 May – 20 May 2022

Agenda Item: 6.19.1.2

Source: Huawei, HiSilicon

Title: Report of [AT118-e][103][CovEnh] RRC CR (Huawei)

Document for: Decision

# 1 Introduction

This document aims at summarizing the following RAN2#118-e offline discussion, which is the continued discussion of [Pre118-e][103][CovEnh] 38331 CR and rapporteur resolutions (Huawei).

**[AT118-e][103][CovEnh] RRC CR (Huawei)**

Initial scope: continue the discussion on the CovEnh WI-specific RILs, also considering the submitted contributions

Initial intended outcome: Summary of the offline discussion with e.g.:

         List of resolved RILs

         List of RILs for online discussion

         List of RILs for further offline discussion

Deadline (for companies' feedback): Thursday 2022-05-12 0000 UTC

Deadline (for rapporteur's summary in R2-2206193): Thursday 2022-05-12 0200 UTC

Contact person(s) for each participating company:

|  |  |  |
| --- | --- | --- |
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# 2 List of WI ASN.1 issues (class 1 and 2)

## 2.1 [Pre118-e] summary

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RIL** | **Issues** | **Relevant clauses/IEs in TS 38.331** | **Proposed Conclusion** | **Company Comment (if you don’t agree with the proposed conclusion)** |
| **Z121** | According to RAN1 decision, the value range of repK-r17 is {1, 2, 4, 8, 12, 16, 24, 32}. That is, values of {1, 2, 4, 8} is missed in current RAN2 specification. Note that, according to field descriptions of repK, if the field repK-r17 is present, the UE shall ignore the repK (without suffix). Thus, missing the values of {1, 2, 4, 8} would mean these values cannot be supported if repK-r17 is configured. | ***repK-r17***  in ConfiguredGrantConfig | PropModify: Change the field name to repK-v1700 |  |
| **I025** | It seems this is a NCE. IF so rename -v1700 | PropAgree: Change the field name to repK-v1700 |
| **Z122** | According to RAN1 decision, for unpaired spectrum, the UE is also not expected to be configured the value of 14 , except for 6, 8, 12, 16. | field descriptions of ***pusch-FrequencyHoppingInterval***  in DMRS-BundlingPUSCH-Config | PropAgree: Change the note of field descriptions of pusch-FrequencyHoppingInterval as follows. Note: For unpaired spectrum, the UE is not expected to be configured the value of s6, s8, s12, s14 and s16. |  |
| **I039** | No mechanism to release. | ***pucch-RepetitionNrofSlots-r17***  in PUCCH-Config | PropAgree: Change Need Code to Need R |  |
| **I038** | No mechanism to release. | ***numberOfSlots-TBoMS-r17***  in PUSCH-TimeDomainResourceAllocationList | PropAgree: Change Need Code to Need R |  |
| **E058** | There are some constraints captured in 38.214 that could be good to include here: Number of slots allocated for TB processing over multi-slot PUSCH for DCI format 0\_1/0\_2. If a number of repetitions K is configured by numberOfRepetitions or numberOfRepetitionsExt, the network configures numberOfSlots-TBoMS (N) and K such that N\*K ≤ 32 (see TS 38.214 [19], clause 6.1.2.1).” | field descriptions of ***numberOfSlots-TBoMS***  in DMRS-BundlingPUSCH-Config | PropAgree: Add:  Number of slots allocated for TB processing over multi-slot PUSCH for DCI format 0\_1/0\_2. If a number of repetitions K is configured by numberOfRepetitions or numberOfRepetitionsExt, the network configures numberOfSlots-TBoMS (N) and K such that N\*K ≤ 32 (see TS 38.214 [19], clause 6.1.2.1).” |  |

**Summary:** The rapporteur understands above Class 1 and 2 RILs are not controversial and no objection is received, and thus the rapporteur proposes for the CE-specific Class 1 and 2 RILs:

**Proposal 1: RIL I025 is agreed and Z121 is modified: Change the field name of *repK-r17* to *repK-v1700*.**

**Proposal 2: RIL Z122 is agreed: Change the note of field descriptions of *pusch-FrequencyHoppingInterval* : For unpaired spectrum, the UE is not expected to be configured the value of s6, s8, s12, s14 and s16.**

**Proposal 3: RIL I039 is agreed: For *pucch-RepetitionNrofSlots-r17*, change Need Code to Need R.**

**Proposal 4: RIL I038 is agreed: For *numberOfSlots-TBoMS-r17*, change Need Code to Need R.**

**Proposal 5: RIL E058 is agreed: Add** **the following sentence to the field descriptions of *numberOfSlots-TBoMS*: Number of slots allocated for TB processing over multi-slot PUSCH for DCI format 0\_1/0\_2. If a number of repetitions K is configured by *numberOfRepetitions* or *numberOfRepetitionsExt*, the network configures *numberOfSlots-TBoMS* (N) and K such that N\*K ≤ 32 (see TS 38.214 [19], clause 6.1.2.1).**

Also note that the CE RRC CR rapporteur will coordinate with RRC rapporteur on the decisions.

## 2.2 [AT118-e] summary

The rapporteur understands above Proposal 1-5 for Class1/2 WI RILs are not controversial, companies are required to confirm above Proposals/RILs

**Q1. Please indicate whether you think Proposal 1-5 as shown above is agreeable or not (Y/N) and provide comments to a particular Proposal/RIL if you don't agree with a particular Proposal/conclusion of a RIL.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Y/N** | **Comments** |
| Huawei, HiSilicon | Y, but except for P5 | It seems not necessary to repeat RAN1 spec in RRC field description, given a reference has been indicated. Otherwise, it would increase the dependency and is prone to causing errors of misalignment. |
| OPPO | Y |  |
| LGE | Y, but | For P5, agree with HW. RAN1 spec reference seems enough for this. |
| Ericsson | Y |  |
| CATT | Y |  |
| ZTE | Y |  |
| NEC | Y |  |

**Summary TBD**

# 3 List of Cross-WI ASN.1 issues (class 1 and 2)

## 3.1 [Pre118-e] summary

According to the Adhoc meeting discussions, the rapporteur understand the CE specific cases can be reviewed in CE discussion, so companies are invited to provide your comment to indicate if you think it should be Need R or Need S.

*Chair: there seems to be general agreement to attempt to use need codes rather than text, but for the details it seems each case need to be reviewed (likely in the context of the WI).*

* P2: Use Need R (instead of Need S) for fields whose absence simply means a configuration is released.
* P3: Use Need R (instead of Need S) for fields for which there are some conditions when network does or does not include the field.

In addition, E146 is also relevant to CE, but this is reflected in RICS RRC CR so it seems better to be discussed in RICS or common ASN.1 session, but after offline check with the proponent company, we think it might be probably up to CE decision, so we can tentatively add this to discussion point and attempt to conclude from CE perspective. Companies are encouraged to indicate if you agree with proposed conclusion from CE perspective.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **RIL** | **Issues** | **Relevant clauses/IEs in TS 38.331** | **Proposed Conclusion** | **Company Comment (**  **1.For N104, to indicate your preference between Need R and Need S;**  **2.For E146, to indicate if you agree with the proposed conclusion)** |
| **N104** | This field seems to be Need S but UE behaviour is purely Need R. It seems how Need S is defined compared to Need R needs refreshment, as this happens with many fields. | ***pucch-DMRS-Bundling-r17***  ***pucch-WindowRestart-r17***  in DMRS-BundlingPUSCH-Config |  | [Huawei, HiSilicon]: Prefer to keep Need S as it is |
| **E146** | Wrong name of the feature introduced by coverage enhancement WI which can be misleading. | ***covEnh***  in FeatureCombination | Rename covEnh to msg3-Repetitions and change the description to “indicates that msg3 repetition is signaled as part of this feature combination”. |  |
|  |  |  |  |  |

**Summary:** Given the low participants, the rapporteur think above two cross-WI RILs can be discussed in RAN2#118-e.

**Proposal 6: To discuss RIL N104 and E146 relevant to CE WI in RAN2#118-e CE session, but should avoid overlap if any RIL is handled in general ASN.1 session.**

## 3.2 [AT118-e] summary

According to the [Pre118-e] discussion outcome, the rapporteur thinks that, Proposal 6 can be further discussed in this offline discussion.

For N104, it is noted that the proponent company has submitted a discussion paper to general ASN.1 discussion as follows (to be discussed in Week2). Thus the rapporteur understands that, it is pending to the conclusion from general ASN.1 discussion, but companies are encouraged to indicate your view (once it is decided to be addressed in specific WI)

R2-2205434 [N104] Survey of Rel-17 Need S fields Nokia, Nokia Shanghai Bell discussion Rel-17 TEI17 Late

**Q2. For RIL N104, please indicate your preferred Option (Need Code) for the CE specific IEs (*pucch-DMRS-Bundling-r17,pucch-WindowRestart-r17*) from CE perspective. Note that the final conclusion is pending to general ASN.1 discussion.**

* **Option 1: Need S (keep the Need Code as it is)**
* **Option 2: Need R (change the Need Code to Need R)**
* **Option 3: No strong view**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option 1, 2 or 3** | **Comments** |
| Huawei, HiSilicon | Option 1 |  |
| OPPO | Option 2 | Prefer to follow the principle that “use Need R (instead of Need S) for fields whose absence simply means a configuration is released.” |
| LGE | Option 2 | It seems no issue to follow the principle made in the last ad hoc meeting. |
| Ericsson | Option 2/3 |  |
| CATT | Option 2 | Need S is used to specify the the UE behavior performed upon receiving a message with the field absent (and not if field description or procedure specifies the UE behavior when field is not configured). So we think that for the fields that when it is absence means a configuration is released, need R is better. |
| ZTE | Option 2 | If the absence of field only means the feature is disabled, then need R should be sufficient. |
| NEC | Option 2 |  |

For E146, the rapporteur understands it can be further discussed in this offline discussion, which can be served as recommendation for RCIS RRC CR.

**Q3. For RIL E146, please indicate your preferred Option (naming) for the CE feature in *FeatureCombination* from CE perspective.**

* **Option 1: covEnh (keep the name as it is)**
* **Option 2: msg3-Repetitions (change the name to msg3-Repetitions, which indicates that msg3 repetition is signaled as part of this feature combination)**
* **Option 3: others**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option 1, 2 or 3** | **Comments** |
| Huawei, HiSilicon | Option 1 | covEnh is more aligned with naming of other features in feature combination. The detailed meaning has been reflected in Stage 3 spec. So it seems okay to use covEnh. |
| OPPO | Option 2 | We think msg3-Repetitions is more accurate. If Msg1 repetition is introduced in R18 coverage enhancement, Msg1 repetition and Msg3 repetition should be two separate CE features in feature combination. |
| LGE | Option 2 | Considering that CE feature in *FeatureCombination* is only for Msg3 repetition, option 2 would be accurate name of this IE. |
| Ericsson | Option 2 | The naming of other features is also likely to be changed. And covEnh is confusing as the only feature that is signaled is msg3 and not other features introduced for coverage enhancement in Rel-18. |
| CATT | Option 2 | We have the same understanding as OPPO. |
| ZTE | Option 2 |  |
| NEC | Option 2 | We need to distinguish Msg3 repetition from Msg1 repetition which may be introduced in Rel-18. |

**Summary TBD**

# 4 List of WI ASN.1 issues (class 0)

## 4.1 [Pre118-e] summary

| **Issue** | **ASN1?**  **Y/N** | **Copied existing specification text.**  **Text should be unique, so that it can be easily found in the specification.**  **If needed, add also the new text.** | **Comment/description/**  **correction** | **Proposed Conclusion** | **Company Comment (if you don’t agree with the proposed conclusion)** |
| --- | --- | --- | --- | --- | --- |
| 378 | N | ***pucch-RepetitionNrofSlots*** Configuration of PUCCH repetition factor per PUCCH resource with associated scheduling DCI corresponding to Rel-17 dynamic PUCCH repetition. This field is applicable when Rel-17 dynamic PUCCH repetition is enabled. | The parameter actually enables dynamic PUCCH repetitions. So the sentence “This field is applicable …” should probably be removed or changed to “This field enables Rel-17 dynamic PUCCH repetitions”. | PropAgree: Remove the sentence “This field is applicable when Rel-17 dynamic PUCCH repetition is enabled” from the field description of *pucch-RepetitionNrofSlots* |  |
| 379 | N | ***pucch-WindowRestart***  Indicates whether UE bundles PUCCH DMRS remaining in a nominal time domain window after event(s) triggered by DCI or MAC CE that violate power consistency and phase continuity requirements is enabled. If the field is absent, PUCCH DMRS bundling remaining in a bundling window after event(s) triggered by DCI or MAC CE that violate power consistency and phase continuity requirements is disabled. Note: Events, which are triggered by DCI or MAC CE, but regarded as semi-static events, e.g. frequency hopping, UL beam switching for multi-TRP operation, or other if defined, are excluded. | Add “(see 38.214 [19], clause 6.1.7)” to the note as the events are better explained there. | PropAgree: Add (see 38.214 [19], clause 6.1.7) to the field description of *pucch-WindowRestart* |  |
| 380 | N | ***pusch-WindowRestart*** … | Add “(see 38.214 [19], clause 6.1.7)” to the note as the events are better explained there. | PropAgree: Add (see 38.214 [19], clause 6.1.7) to the field description of *pusch-WindowRestart* |  |

**Summary:** The rapporteur understands above Class 0 RILs are not controversial and no objection is received, and thus the rapporteur proposes for the CE-specific Class 0 RILs:

**Proposal 7: Issue 378, 379 and 380 are agreed and captured into the CE RRC CR.**

Also note that the CE RRC CR rapporteur will coordinate with RRC rapporteur on the decisions.

## 4.2 [AT118-e] summary

The rapporteur understands above Proposal 7 for Class0 WI issues is not controversial, companies are required to confirm above Proposal/Issues

**Q4. Please indicate whether you think Proposal 7 as shown above is agreeable or not (Y/N) and provide comments if you don't agree with the conclusion of a particular Class 0 issue 378/379/380.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Y/N** | **Comments** |
| Huawei, HiSilicon | Y |  |
| OPPO | Y |  |
| LGE | Y |  |
| Ericsson | Y |  |
| CATT | Y |  |
| ZTE | Y |  |
| NEC | Y |  |

**Summary TBD**

# 5 Other open issues

## 5.1 [Pre118-e] summary

Note that there is an EN relevant to CE RACH parameters as follows. Given that the RA partitioning structure is steady, it is therefore necessary to address how to implement the CE RACH parameters: numberOfMsg3Repetitions, mcs-Msg3Repetition

Editor's Note: FFS where to implement CE-specific RACH-related parameters, e.g. numberOfMsg3Repetitions, mcs-Msg3Repetition, is pending to RA partitioning conclusion on the structure

The rapporteur thinks there can be the following options to address this:

**Option 1**: Per RA partition configuration: To add them in the field of featureSpecificParameters-r17 with conditional presence indicating it can be only present if CE is present in the featurecomb

**Option 2**: Common configuration: To add them in IE RACH-ConfigCommon and explicitly indicate these parameters are only used for CE feature

|  |  |  |  |
| --- | --- | --- | --- |
| **Issues** | **Relevant clauses/IEs in TS 38.331** | **Proposed Conclusion** | **Company Comment (to indicate your preference among Options)** |
| Editor's Note: FFS where to implement CE-specific RACH-related parameters, e.g. numberOfMsg3Repetitions, mcs-Msg3Repetition, is pending to RA partitioning conclusion on the structure | numberOfMsg3Repetitions  mcs-Msg3Repetition  (To be added) |  | [Huawei, HiSilicon]: Just different taste, we prefer Option 1 but are also okay with Option 2 if it is majority view.  Ericsson]: Option 2. We think it would be easier to have them implemented as part of per random access partition configuration. We do not see the need to have separate MCS/repetition configuration for this release. We proposed in our contribution to have it is part of BWP-UplinkCommon to make them BWP-specific. |
| Ericsson:  The value shall not exceed the maximum duration defined in TS 38.101-1 [15] and TS 38.101-2 [39]. | pucch-TimeDomainWindowLength | PropAgree: Change to “the maximum duration for DMRS bundling for PUCCH as specified in TS 38.306 [26]”in the field description of *pucch-TimeDomainWindowLength* | [Ericsson]: This is not the maximum value supported in the RAN4 specs, but is a UE capability.  Agreement:  Definition of **the maximum duration**: a maximum time duration during which **UE is able to** maintain power consistency and phase continuity subject to power consistency and phase continuity requirements.  Change to:  “… the maximum duration for DMRS bundling supported by the UE as specified TS 38.306”  [Rapp]: Thanks for pointing it out. After internal check with RAN1, we think the understanding from Jonas is correct that it is indicated by UE capability rather than pure RAN4 restriction, so the original text from RAN1 should be updated accordingly, |
| Ericsson:  The value shall not exceed the maximum duration defined in TS 38.101-1 [15] and TS 38.101-2 [39]. | pusch-TimeDomainWindowLength | PropAgree: Change to “the maximum duration for DMRS bundling for PUSCH as specified in TS 38.306 [26]”in the field description of *pusch-TimeDomainWindowLength* | [Ericsson]:  Same comment as for PUCCH  [Rapp]: Thanks for pointing it out. After internal check with RAN1, we think the understanding from Jonas is correct that it is indicated by UE capability rather than pure RAN4 restriction, so the original text from RAN1 should be updated accordingly, |
| Huawei, HiSilicon:  ***pucch-RepetitionNrofSlots***  If this field is absent in a PUCCH resource with associated scheduling DCI, the UE applies the value of field *nrofSlots*.  Currently the value range of *pucch-RepetitionNrofSlots* is {n2, n4, n8} and n1 can be configured only when *nrofSlots* is set to n1 (indicated by highlight text above in the corresponding field description). However, *pucch-RepetitionNrofSlots* and *nrofSlots* are applicable to different granularity where *pucch-RepetitionNrofSlots* is per PUCCH resource while *nrofSlots* is per PUCCH format. Consequently, the current mechanism to enable n1 would restrict the flexibility of network to configure the value of n1 to a PUCCH resource for R17 PUCCH repetition. So it seems necessary to introduce n1 into the value range of *pucch-RepetitionNrofSlots* to enable the value of n1 independently for a PUCCH resource. | pucch-RepetitionNrofSlots | It is proposed to add n1 in the value range of *pucch-RepetitionNrofSlots-r17* | [Huawei, HiSilicon]: It is RAN2’s work to decide how to enable a default value and we see some benefit to re-consider the mechanism to enable the value of n1. |

**Summary:** Forthe issue relevant to the “maximum duration for DMRS bundling”, the rapporteur understand the comment from the proponent company is technically correct and it can be agreeable. However, for the remaining EN and issue of R17 PUCCH repetition number, given the low participant, the rapporteur think further discussion is needed. Thus, the rapporteur propose:

**Proposal 8: Change to “the maximum duration for DMRS bundling for PUCCH/PUSCH as specified in TS 38.306 [26]” in the field description of *pucch-TimeDomainWindowLength* and *pusch-TimeDomainWindowLength*.**

**Proposal 9: To discuss the EN about how to implement the left CE RACH parameters: *numberOfMsg3Repetitions*, *mcs-Msg3Repetition*.**

**Proposal 10: To discuss if the mechanism to enable n1 of pucch-*RepetitionNrofSlots* needs to be re-considered, and if so, how to fix it.**

## 5.2 [AT118-e] summary

For the issue relevant to “maximum duration for DMRS bundling”, the rapporteur understands it can be further confirmed in this offline discussion.

**Q5. For the issue relevant to “maximum duration for DMRS bundling”, please indicate whether you think Proposal 8 as shown above is agreeable or not (Y/N) and provide comments if you don't agree with Proposal 8.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Y/N** | **Comments** |
| Huawei, HiSilicon | Y | Technically correct. But we would like to note that the details of “maximum duration for DMRS bundling” is still FFS in UE capability discussions. But we assume it would be specified in TS 38.306, so it should be fine to agree P8. |
| OPPO | Y |  |
| LGE | Y |  |
| **Ericsson** | Y |  |
| CATT | Y |  |
| ZTE | Y |  |
| NEC | Y |  |

For the EN as follows, the rapporteur think it can be further discussed in this offline discussion.

Editor's Note: FFS where to implement CE-specific RACH-related parameters, e.g. numberOfMsg3Repetitions, mcs-Msg3Repetition, is pending to RA partitioning conclusion on the structure

The rapporteur thinks there can be the following options to address this:

* **Option 1: Per RA partition configuration: To add them in the field of featureSpecificParameters-r17 with conditional presence indicating it can be only present if CE is present in the feature combination**
* **Option 2: Common configuration: To add them in IE RACH-ConfigCommon and explicitly indicate these parameters are only used for CE feature**
* **Option 3: Common configuration: To add them in IE BWP-UplinkCommon and explicitly indicate these parameters are only used for CE feature**

**Q6. For the EN relevant to how to implement CE-RACH parameters, please indicate your preferred Option among 1,2 and 3 as shown above and comments if any.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Option 1, 2 or 3** | **Comments** |
| Huawei, HiSilicon | Option 1 | All options work. But the main difference is Option 1 allows NW to have separate configuration for different feature/combination. Since the current ASN.1 structure has introduced a field of featureSpecificParameters-r17 to group all feature specific parameters, we think it is natural to put CE RACH parameters there. |
| OPPO | Option 1 |  |
| LGE | Option 2 or 3 | One common configuration seems enough for these two parameters, but no strong view, if majority want option 1, we can compromise option 1. |
| Ericsson | Option 2 or 3 (preference for 3) | RIP seemed to have agreed that rsrp-Threshold-Msg3 is configured per BWP and not per RA partition configuration, thus we see no need to have these parameters per RA partition and we do not think that this flexibility is needed. If we have more than one RA partition with CE then we can save a decent amount of bits for SIB1. |
| CATT | Option 1 |  |
| ZTE | Option 2 | Option 2 is also per RACH partition configuration, e.g. separate RO case.  AdditionalRACH-ConfigCommon-r17 ::= SEQUENCE {  rach-ConfigCommon-r17 RACH-ConfigCommon OPTIONAL, -- Need R  msgA-ConfigCommon-r17 MsgA-ConfigCommon-r16 OPTIONAL, -- Cond R  ...  }  We prefer Option 2, because it is already captured in RAN1 spec TS 38.213:  *A UE can be provided in RACH-ConfigCommon a set of numbers of repetitions for a PUSCH transmission with PUSCH repetition Type A that is scheduled by a RAR UL grant or by a DCI format 0\_0 with CRC scrambled by a TC-RNTI.*  Technically, the fields indicate a set of numbers, in most cases, a given set is applicable for different RACH partitions. |
| NEC | Option 1 |  |

For the issue of R17 dynamic PUCCH repetition number to enable default n1, the rapporteur think it can be further discussed in this offline discussion.

**Q7. For the issue of enabling P17 dynamic PUCCH repetition number 1, please indicate whether you agree that n1 can be added to the value range to enable the default number of P17 dynamic PUCCH repetition number**

|  |  |  |
| --- | --- | --- |
| **Company** | **Y/N** | **Comments** |
| Huawei, HiSilicon | Y | We think it is over restrictive for the NW configuration and there is much benefit to enable the default value of n1 for R17 dynamic PUCCH repetition number, without relying on limiting n1 to legacy PUCCH repetition number. We believe that it is RAN2 territory to design the default mechanism and thus adding n1 is the simplest way from RAN2 perspective. |
| OPPO | Y |  |
| LGE | Y |  |
| Ericsson | Y |  |
| CATT | Y |  |
| ZTE | Y |  |
| NEC | Y |  |

**Summary TBD**

# References

1. RIL issue list v\_207
2. R2-20xxxxx NR Rel-17 ASN1 Editorials v59