3GPP TSG-RAN WG2 #110-e R2-2004954

Electronic, June 1 – June 12, 2020

Agenda Item: 6.7.2.2

Source: Ericsson

Title: Email discussion summary [AT110e][042][IIOT] RRC (Ericsson)

Document for: Discussion, Decision

# 1 Introduction

This document summarizes the part 1 of the below email discussion.

* **[AT110e][042][IIOT] RRC (Ericsson)**

Scope: Treat at least email discussion summary in R2-2004954 and the resulting updated CR. Address all other relevant Review issues (RILs), with or without tdocs. Implement meeting agreements in the CR.

Part 1: Agreements (rapporteur to announce deadline)

Part 2: Agreed CRs 38331 (36331 if applicable)

Deadline: June 11, 0700 UTC

The RIL issue status is copied in the Annex 5. For those issues tagged with “PropAgree” and “PropReject”, since no comments are received, they are promoted to “ConcAgree” and “ConcReject” (i.e., they are concluded as agreed and rejected).

In the rest of the document, we discuss the following un-resolved class 3 RIL issues.

* N041, N042, O316, E223, H570, H578

Other un-resolved class 3 RIL issues are handled as follows and the agreements will be incorporated in the RRC CR.

* E225, C601: they are discussed AI 6.7.4.1 (see R2-2005723, proposal 1 and proposal 4) and the email discussion “[AT110e][045][IIOT] PDCP Duplication and PDCP CRs (LG)”.
* E221: It is related with the open issue in AI 6.7.2.1 and covered by the email discussion “[AT110e][041][IIOT] Accurate Reference Time (NTT DOCOMO)”.

# 2 Discussion

## 2.1 N041, N042

|  |  |  |
| --- | --- | --- |
|  | Comments | Proposed changes |
| N041 | It was agreed that up to 32 SPS configuration can be configured per Cell Group across all BWPs, but this limitation is not captured anywhere. | Clarify in the sps-ConfigToAddModList that the network may configure up to 32 SPS configurations across all BWPs within a Cell Group. |
| N042 | It was agreed that up to 32 CG configurations can be configured per Cell Group across all BWPs, but this limitation is not captured anywhere. | Clarify in the configuredGrantConfigToAddModList that the network may configure up to 32 CG configurations across all BWPs within a Cell Group. |

**Rapporteur summary:**

On CG:

It is agreed in RAN2#109e:

* Maximum 32 CG configurations per MAC entity

This agreement is to

1. design the Multiple Entry Configured Grant Confirmation MAC CE
2. address the allowed CG list on a MAC entity level in the LCP

Consequently, a constant *maxNrofConfiguredGrantConfigMAC* is defined in RRC in clause 6.4:

maxNrofConfiguredGrantConfigMAC-r16     INTEGER ::= 32      -- Maximum number of configured grant configurations per MAC entity

It is clearly written that “the maximum number of configured grant configurations per MAC entity is 32.”

Although N042 can be a good clarification, rapporteur’s understanding is that it is not necessary. Thus, rapporteur prefers not capturing this and propose

**Proposal 1a RAN2 confirm that “up-to 32 CG configurations can be configured per Cell Group across all BWPs” is captured by the constant maxNrofConfiguredGrantConfigMAC-r16.**

Question 1: Do you support proposal 1a?

|  |  |  |
| --- | --- | --- |
| Company | Support P-1a (y/n) | Additional comments |
| MediaTek | Yes | There is no need to add unnecessary text to the field description in RRC |
| OPPO | y |  |
| vivo | y |  |
| ZTE | y |  |
| Huawei | Yes |  |
| CATT | Yes | Agree with the rapporteur |
| Samsung | Yes |  |
| LG | Yes |  |
| Nokia | Yes | We are OK with that approach |
| DOCOMO | Yes |  |

On SPS:

In the RRC v16.0, network can configure up-to 8 SPS configurations per BWP. There is an agreement in RAN2#109bis-e:

* [026] Support up to 32 SPS configurations per MAC entity.

It is not clear whether this applies to ignaling constraint or capability. Since there is no clear motivation to introduce a ignaling restriction per MAC entity, rapporteur understands that this agreement is related with capability. There is a similar understanding in the paper R2-2005153 [3] and the paper R2-2003526 [4].

On the other hand, it is unfortunate that the maximum number of configured SPS configurations in a cell group (i.e., per MAC entity) is also under discussion in RAN1, see FG 12-2 component 1) in the paper R1-2003073 [2]. It is rapporteur’s understanding that RAN1 would settle down on one exact number. In other words, the number of SPS configuration per MAC entity will be captured in the RAN1 part of the capability CR 38.306. There might be even a risk that RAN1 makes a different agreement from RAN2. In that case, RAN1/2 can further discuss.

As a conclusion, rapporteur understands that this restriction will be captured in 38.306. The capability discussion is indeed separate from this email discussion. To avoid procedure-wise inter-dependence, rapporteur prefers not capturing this in the RRC CR.

**Proposal 1b “Support up to 32 SPS configurations per MAC entity” is not captured in 38.331.**

Question 2: Do you support proposal 1b? If there are comments on the above rapporteur’s understanding, please provide them below too.

|  |  |  |
| --- | --- | --- |
| Company | Support P-1b (y/n) | Additional comments |
| MediaTek | Yes | There is no need to add unnecessary text to the field description in RRC |
| OPPO | y | We share the similar view with rapporteur, and prefer it can be captured as UE capability. Considering the related UE capability is discussed in RAN1, to avoid overlap work, we are fine to wait for RAN1 process. However, we have one concern on RAN1 capability. As the capability defined in RAN1 is the max number of SPS/CG across all serving cells. To us, it is unclear whether the restriction is per MAC or per UE. So, we hope there is a room to clarify it. Maybe an LS sent to RAN1 can be considered? |
| Vivo | y | We are ok to capture the restriction in 38.306. |
| ZTE | Yes | Agree with rapporteur |
| Huaweif | Yes |  |
| CATT | Yes | Agree with the rapporteur |
| Samsung | Yes | Agree with the rapporteur |
| LG | Yes |  |
| Nokia | Yes | We are OK with that approach |
| DOCOMO | Yes |  |

## 2.2 O316

|  |  |  |
| --- | --- | --- |
|  | Comments | Proposed changes |
| O316: | Currently, this sentence restricts that the configuration of MoreThanTwoRLC can only be done when there is no RLC re-establishment, yet this would lead to the duplication (of 4-leg) configuration cannot be done together with RLC re-establishment (e.g., handover). By checking the R15 condition of “MoreThanOneRLC”, the sentence should be something like: “Upon RRC reconfiguration when a PDCP entity is associated with multiple logical channels, this field is optionally present need M.” | Change the sentence to “Upon RRC reconfiguration when a PDCP entity is associated with multiple logical channels, this field is optionally present need M.” |

**Rapporteur summary:**

This RIL is related with the conditional presence for the field *moreThanTwoRLC-r16*. Recall the field is used to configure DRB PDCP duplication with more than two RLC entities and so the proposed change should be “associated with **more than two** logical channels”.

|  |
| --- |
| For SRBs, this field is absent.  For DRBs, this field is mandatory present upon RRC reconfiguration with setup of a PDCP entity for a radio bearer with more than two associated logical channels and upon RRC reconfiguration with the association of more than one additional logical channel to the PDCP entity.  Upon RRC reconfiguration when none of the RLC entities is re-established, this field is optionally present, Need M. Otherwise, the field is absent, Need R. |

The wording in RRC v16.0 is more restrictive as the RIL issue comment pointed out, and the proposal is to use the same wording of the conditional presence for the field *moreThanOneRLC*. This wording in the RRC v16.0 has been there since the first version of the draft CR, and so rapporteur would like to collect views from companies on whether there are any concerns for the proposal.

Question 3: Do you support changing the sentence ”Upon RRC reconfiguration when **none of the RLC entities is re-established**, this field is optionally present” ***to*** ”Upon RRC reconfiguration when **a PDCP entity is associated with more than two logical channels**, this field is optionally present”?

|  |  |  |
| --- | --- | --- |
| Company | y/n | Additional comments |
| MediaTek | Yes | We agree with Oppo’s reasoning for this RIL, i.e. it should be allowed to duplication configured across a handover. |
| OPPO | y | As mentioned, with the last paragraph in current version, the configuration of *MoreThanTwoRLC* can only be done when there is no RLC re-establishment, i.e. more than two RLCs duplication can not be configured if any of RLC entities is re-established. Yet, this would lead to the duplication (of up to 4-leg) configuration cannot be done together with RLC re-establishment (e.g., handover). Clearly, no restriction similar as the above is defined for Rel-15 duplication. In addition, if we recall the memory, the restriction is not discussed before. Also, there is no clear reason/benefit to disallow configuration for duplication (of up to 4-leg) and RLC re-establishment together. So we prefer to use the principle similar as Rel-15. |
| Vivo | y | If there is no issue for configuring duplication during handover, maybe we should allow such configuration. |
| ZTE | Y |  |
| Huawei | Yes |  |
| CATT | Yes |  |
| Samsung | Yes |  |
| LG | Yes |  |
| Nokia | Yes |  |
| DOCOMO | yes | For intra-CU reconfigure with sync, it is possible. |

## 2.3 E223

|  |  |  |
| --- | --- | --- |
|  | Comments | Proposed changes |
| E223 | For better ASN.1 structure (to put in a IE that was introduced in URLLC WI), this change is proposed in the work item session. Companies want to confirm RAN1 impacts | Discuss and resovled in WI session |

**Rapporteur summary:**

This was initially proposed in the paper R2-2003526 [5] in RAN2#109bis-e. The rapporteur has adopted the suggestion to further optimize the ASN.1 code structure. The changes were captured in the endorsed CR, but there was one company concern on RAN1 impacts and indicated more time is needed to check.

In the RRC v16.0, a new filed “harq-CodebookID-r16, INTEGER (1..2)” in added in *SPS-Config* to indicate a HARQ-ACK codebook index. The PUCCH resources for HARQ-ACK feedbacks are allocated as below

SPS-PUCCH-AN-List-r16 ::= SEQUENCE {

harq-CodebookID-r16 INTEGER (1..2),

sps-PUCCH-AN-CodebookResource-r16 SEQUENCE (SIZE(1..4)) OF SPS-PUCCH-AN-r16

}

SPS-PUCCH-AN-r16 ::= SEQUENCE {

sps-PUCCH-AN-ResourceID-r16 PUCCH-ResourceId,

maxPayloadSize-r16 INTEGER (4..256) OPTIONAL -- Need R

}

There are two HARQ-ACK feedback PUCCH resource allocations per BWP, and they are common for the DL SPS with the same *harq-CodebookID-r16.*

The legacy PUCCH feedback resource is configured in SPS-Config, i.e., n1PUCCH-AN. It seems natural to follow the same principle when extending to multiple SPS configurations. Note that, this would be added under *BWP-DownlinkDedicated*.

The proposal in R2-2003526 is to add the below field to *PUCCH-config*

sps-PUCCH-AN-CodebookResource-r16 SEQUENCE (SIZE(1..4)) OF SPS-PUCCH-AN-r16

The IE *PUCCH-ConfigurationList* is used to configure two simultaneously constructed HARQ-ACK codebooks. There is an implicit *harq-CodebookID* associated with each *PUCCH-Config,* i.e., *harq-codeBook=1* (or 2) corresponds to PUCCH-config 1 (or PUCCH-config 2). This is cleaner since two simultaneously constructed HARQ-ACK related resource allocations are all in one place.

There was a comment during RAN2#109bis that this proposal may imply

if *harq-codebookID=1* (or 2), then *SPS-PUCCH-AN-r16* can only be configured with PUCCH-resources in PUCCH-Config 1 (or PUCCH-Config 2).

It is indeed not clear what RAN1 intention is. On the other hand, in light of the below eURLLC WI understanding, from ignaling point of view, it is feasible to configure *SPS-PUCCH-AN-r16* in PUCCH-Config 1 while its PUCCH resource is configured in PUCCH-Config 2.

* RAN2 confirms that different PUCCH resource IDs are configured in different PUCCH-Config when two PUCCH-Configs are simultaneously configured in URLLC WI.

From RAN2 signalling point of view, all configuration possibilities are covered regardless of RAN1 intention.

Therefore, rapporteur proposes to confirm this change.

**Proposal 3 RAN2 confirm moving sps-PUCCH-AN-List from SPS-ConfigList to PUCCH-Config.**

Question 4: Do you support proposal 3?

|  |  |  |
| --- | --- | --- |
| Company | y/n | Additional comments |
| OPPO | y | No technical issue is foreseen. |
| ZTE | Y |  |
| Samsung | y | no technical issue foreseen |
| LG | Y |  |
| Nokia | Yes |  |
| DOCOMO | Yes |  |

## 2.4 H570

|  |  |  |
| --- | --- | --- |
|  | Comments | Proposed changes |
| H570 | the term “interest in reference time information” might not be best to reflect UE preference. | “- its preference on reference time information provision.” |

**Rapporteur summary:**

In the endorsed running CR, the wording is as below

|  |
| --- |
| A UE capable of providing an indication of its interest in reference time information may initiate the procedure upon being configured to provide an indication of its interest in reference time information, or if it was configured to provide this indication and upon change of its interest in reference time information. |

In the baseline CR (appendix A of R2-2004150 [6]), the wording is not consistent, and both “preference” and “interest” are used.

Arguments for using the wording “preference“

1. “preference” has been used for all other UAIs and it could be good to align with them.
2. ?

Arguments for using the wording “interests”

1. For reference clock, UE does not need it to perform any radio access and the clock is used for application layer function (e.g., gPTP time stamping). Rapporteur decided to choose the wording “interest” to distinguish this UAI from these other UAIs which are radio access related.
2. ?

Interested companies are invited to add further arguments (if any) above.

Question 5: Which wording option do you prefer?

Option 1 “**interest** in being provisioned with reference time information”

Option 2 “**preference** in being provisioned with reference time information”

|  |  |  |
| --- | --- | --- |
| Company | Option 1 / 2 | Additional comments |
| MediaTek | Option 2 | Slight preference for option 2 as this formulation is consistent with the rest of the UAI section and does not introduce a new term. |
| OPPO | 2 | We slightly prefer to use the consistent term with other UAI section. |
| Vivo | No strong view | Both wordings do not have any confusion. |
| ZTE | No strong point of view |  |
| Huawei | 2 | Precisely speaking, the information reported by a UE is its request or preference on reference time information provision, as UE only sends such information when it is sure that it needs an updated reference time information. The current term “its interest in reference time information” in RRC spec seems not quite accurate and it could allow the interpretation that gNB can “ignore” this assistance information. However this interpretation is counterproductive in respect of introducing such assistance information.  Further, the term “interest” is not widely used in RRC specification except the “sidelink” related sections. The commonly used term for UE assistance information is “preference” as can be seen in e.g. section 5.7.4.1.  On the suggestion that as the “time information” is application level related information so the associated terminology shall reflect this difference from radio related information: we are not convinced that RAN2 should use this criterion to separate terms used for application related information and radio related element. |
| CATT | 2 | For consistency with others UAIs. |
| Samsung | 2 | Both options are clear but we slightly prefer consistency. |
| LG | 2 | For consistency. |
| Nokia | 1 / other | No strong view, but Option 2 sounds odd to us. Couldn’t we say “request to be provisioned”? |
| DOCOMO |  | No strong view. |

## 2.5 H578

|  |  |  |
| --- | --- | --- |
|  | Comments | Proposed changes |
| H570 | UE capability parameter maxNumberEHC-Contexts is missing | add: maxNumberEHC-Contexts-r16 ENUMERATED {cs2, cs4, cs8, cs12, cs16, cs24, cs32, cs48, cs64, cs128, cs256, cs512, cs1024, cs16384, cs32786，cs65536) |

**Rapporteur summary:**

There is a separate RRC CR that captures UE capability parameters, see email discussion [AT110e][048][IIOT] UE capabilities (Nokia). This RIL was not identified correctly in the ASN.1 review file by the rapporteur, and the rapporteur proposes to change it “ConcReject”, i.e., it is concluded as rejected.

**Proposal 5 Set the status of RIL issue H578 to “ConcReject”.**

Question 6: Do you support proposal 5?

|  |  |  |
| --- | --- | --- |
| Company | y/n | Additional comments |
| MediaTek | Yes | We should not be addressing RILs for UE capabilities at this point in time. |
| OPPO | y |  |
| vivo | y |  |
| ZTE | y |  |
| CATT | Yes |  |
| Samsung | Yes | Agree with MediaTek |
| LG | Yes |  |
| Nokia | Yes | This is included in the (draft) RRC CR for capabilities in R2-2004682 (NR) and R2-2004683 (LTE), which will be further modified based on the agreements from this meeting. |
| DOCOMO | Yes |  |

# 3 Conclusion

TBD

# 4 References

1. R2-2005318, 38331 Rel-16 Ph2 ASN.1 review file, Ericsson
2. R1-2003073, RAN1 UE features list for Rel-16 NR after RAN1#100bis-E, AT&T, NTT DOCOMO, INC.
3. R2-2005153, Discussion about remaining issues on scheduling enhancements, Huawei
4. R2-2005335, How to capture maximum number of SPS/CG per MAC, OPPO vivo
5. R2-2003526, SPS Ack configuration in RRC, Qualcomm
6. R2-2004150, Report of [AT109bis-e][025][IIOT] Accurate Reference Timing (vivo), vivo

# 5 IIoT Class 3 RIL issues status in Ph2 review [1]

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Work Item** | **Class** | **Status** |
| H570 | IIOT | 3 | DiscMail2 |
| N042 | IIOT | 3 | DiscMail2 |
| O316 | IIoT | 3 | DiscMail2 |
| E223 | IIoT | 3 | DiscMail2 |
| N041 | IIOT | 3 | DiscMail2 |
| E225 | IIoT | 3 | DiscMail2 (tdoc) |
| C601 | IIOT | 3 | DiscMail2 (tdoc) |
| E221 | IIoT | 3 | DiscMeet2 |
| H578 | IIOT | 3 | DiscMeet2 |
| Z105 | IIOT | 3 | PropAgree2 |
| H572 | IIOT | 3 | PropAgree2 |
| E222 | IIoT | 3 | PropAgree2 |
| H577 | IIOT | 3 | PropAgree2 |
| E226 | IIoT | 3 | PropAgree2 |
| H580 | IIOT | 3 | PropAgree2 |
| H575 | IIOT | 3 | PropAgree2 |
| E224 | IIoT | 3 | PropAgree2 |
| H576 | IIOT | 3 | PropAgree2 |
| E227 | IIoT | 3 | PropAgree2 |
| H571 | IIOT | 3 | PropReject2 |
| S207 | IIOT | 3 | PropReject2 |