**3GPP TSG-RAN WG2 Meeting #109 electronic R2-20xxxxx**

**24 Feb – 6 Mar 2020**

**Agenda item: 6.4.2.1**

**Source: Huawei (Rapporteur)**

**Title: Report for the offline discussion on Category-2 proposals in RRC summary**

**Document for: Discussion and Decision**

# Introduction

This document includes the offline discussion #702 on the related issues and proposals which were discussed in the RRC summary submitted in R2-2002093 [1]. According to the scope clarified during the on-line discussion on Monday, only the Proposal C-2 and proposals in Category 2, i.e. “Proposal that need further discussion [FFS]” in [1] are within the scope of this offline discussion. Note that original proposal C-3 and C-3a which are related to MAC reset aspects will be handled by MAC related offline discussion, not here.

R2-2002093 Summary document for AI 6.4.2.1 - RRC aspects Huawei (Rapporteur) discussion Rel-16 5G\_V2X\_NRSL-Core

* Proposal C-1 is agreed.
* Proposal C-2b will be discussed in offline.
* Proposal C-11 is agreed.
* Proposal C-2 to proposal C-10a will be discussed in offline (may exclude some proposals, Proposal C-3 will be discussed in MAC related offline.).
* [Offline Disc#702]: To discuss the proposals identified in the above for further offline discussion (Huawei, R2-2001965) (Comeback Thurs.)
* [Offline Disc#703]: To update and agree 38.331/36.331 CR (Huawei, R2-2001966 for 38.331 CR, R2-2001967 for 36.331 CR) (Comeback Thurs. or next Wed.)

# Discussions

### Discussion on Proposal C-2/C-2a/C-2b – SL-RSRP reporting

The below questions are to collect companies’ views of proposal C-2 and C-2a in [1]. It is about SL-RSRP reporting and what is specifically going to be discussed is “whether to introduce a “delta” measurement result for the event triggered SL-RSRP reporting from the RX UE to the TX UE, or even more trigger events are needed (e.g. TX UE triggered RX UE reporting)”. The specific technical issue is that, if only relying on the A1-like and A2-like events agreed in the last meeting for even-triggered SL-RSRP from the RX UE to the TX UE, i.e. reporting if the absolute SL-RSRP result becomes above/below an threshold, there may be the case that the SL-RSRP keeps on staying above/below the corresponding threshold, so that the TX UE cannot get any SL-RSRP result, thus unable to carry out power control as RAN1 expected.

* **Question 1**: Should an event based on “delta” SL-RSRP measurement results be supported for the event triggered SL-RSRP reporting at the RX UE?

1. Yes, if the delta value between the current measured SL-RSRP and the last reported SL-RSRP exceeds a threshold, then the SL-RSRP reporting is triggered;
2. No, it is not needed.

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| **Companies are invited to provide views below for Question 1** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | a) | Obviously periodical triggering is not efficient, and the current A1/A2 like events are not useful for the RSRP reporting for SL, which is mainly used for power control, i.e., TX power has to be adjusted when the RSRP change is larger than a threshold. Similar trigger has been defined for PHR, following the same spirit. |
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**Result and Conclusion of Q1:**

* **Question 1a**: On top of the events already agreed, are there even more events that need to be specified for the event triggered SL-RSRP reporting from the RX UE to the TX UE?

1. Yes, TX-triggered SL-RSRP reporting for the RX UE is needed. If this option is selected, please detail the standard impacts (i.e. how TX UE decides whether/when the SL-RSRP reporting needs to be triggered, what message is used to inform the RX UE if triggered, etc.)
2. No, it is not needed.

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| **Companies are invited to provide views below for Question 1a** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | b) | According to the running CR, the triggering of RSRP reporting is configured by Tx-UE via PC5-RRC (either timer triggered or event triggered), following the same approach used by Uu interface. Under the current framework, after adding the “delta” event, we believe no additional event needed. |
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**Result and Conclusion of Q1a:**

The below question is to collect companies’ views of proposal C-2b in [1]. It is about SL-RSRP reporting and the issue to be addressed is “what if the SL-RSRP result is not available at each periodic SL-RSRP reporting occasion, due to no-ongoing SL transmission on the corresponding SL-RSRP reporting period”. Based on the on-line discussion on Monday, the candidates include that the UE does not perform SL-RSRP reporting in such case, and that it is up to UE implementation how to deal with this situation.

* **Question 2** For a reporting occasion in periodic SL-RSRP reporting, if the SL-RSRP measurement result is unavailable in the latest reporting period, due to no ongoing reporting SL transmission, how should the UE behave at this reporting occasion?

1. The SL-RSRP reporting is not carried out by the UE at this specific reporting occasion
2. It is up to UE implementation, and a NOTE is captured in the TS 38.331.
3. It is up to UE implementation, and not any standard impact is needed.

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| **Companies are invited to provide views below for Question 2** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | C | As commented online, the problem may also happen in R15 system, e.g., CSI-RS pre-empted by SSB, so we believe the legacy specification can already handle the situation, so no standard impact is needed. |
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**Result and Conclusion of Q2:**

### Discussion on Proposal C-4/C-4a/C-4b – Mode-2 TX pool selection

The below questions are to collect companies’ views on Proposal C-4/C-4a/C-4b in [1]. It is about mode-2 TX resource pool selection, and the reason why this issue is discussed as one of the RRC aspects is that in LTE V2X SL, it is RRC layer of the UE which selects the specific mode-2 TX pool used at a given time and instructs the selected TX pool to the lower layers. As per proposal C-4, there could be three options, i.e. zone-based selection, HARQ FB based selection and UE implementation based selection, as indicated in the below Question 3.

Rapporteur would like to note that besides the per-pool configurations in LTE V2X SL, e.g. CBR-priority lookup table, speed-priority look-up table, etc., even more factors have been agreed by RAN1 to be configured in a per-pool manner in NR SL, e.g. applicable MCS table. As a result, it seems not enough to consider only some isolated factors like zone, HARQ FB resources, priority, CBR, etc., separately for the selection of a resource pool; instead, all above potential should be taken into account. It is obvious not desirable to specify how the UE exhaust all of above factors in the standard, and thus the simplest way is to leave the mode-2 TX resource pool selection to UE implementation which is going to take into consideration all above factors and make the best choice.

* **Question 3**: How is mode-2 TX resource pool selection performed, in case multiple pools are (pre-)configured?

1. Zone-based resource pool selection – the UE selects resource pool(s) associated with its current geo-location;
2. HARQ FB based resource pool selection – the UE selects the resource pool based on whether there is an SLRB with HARQ FB enabled and whether the resource pools have PSFCH resources;
3. Resource pool selection is up to UE implementation – no standardization efforts, simplest way.

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| **Companies are invited to provide views below for Question 3** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | c | For zone-based resource pool, RAN2 previously has sent a LS to RAN1, yet no reply from RAN1 yet. Considering that no progress in RAN1 on this part yet, RAN2 should not further proceed on this aspect.  For FB based resource pool solution, we agree with the rapporteur analysis that there would factors more than HARQ FB that affects pool selection. In order to avoid over-specifying various factors for pool selection in R16 (and later in R17+), option c) can solve all these issues ultimately. |
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**Result and Conclusion of Q3:**

* **Question 3a**: In case Option a) is selected in Q3, are two sets of zone configurations needed (with one used for mode-2 resource pool selection and the other used for distance calculation by RAN1)?

1. Yes. If this option is selected, please clarify the reason.
2. No.

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| **Companies are invited to provide views below for Question 3a** | | |
| **Companies** | **Preferred options** | **Comments if any** |
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**Result and Conclusion of Q3a:**

As there is anyway the issue on whether the UE’s RRC layer instructs all (pre-)configured mode-2 TX resource pools to the lower layers, or only instructs the selected one, regardless of which option is selected above in Q3; therefore, below question is to discuss this issue.

* **Question 4**: Should the RRC layer of the UE instruct all the mode-2 TX resource pools (pre-)configured or instruct only the mode-2 TX resource pool selected to the lower layers?

1. Instruct all the mode-2 TX resource pools (pre-)configured to the lower layers, with lower layers performing pool selection (similar to LTE D2D);
2. Instruct the selected mode-2 TX resource pool to the lower layers, with RRC layer carrying out the resource pool selection (similar to LTE V2X SL).

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| **Companies are invited to provide views below for Question 4** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | a) | As replied in Q3, the factors that affects pool selection are mostly up to MAC layer decision, so it is straightforward to rely on MAC layer to perform pool selection. |
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**Result and Conclusion of Q4:**

### Discussion on Proposal C-5 – AS configuration failure related

This section discuss the *RRCReconfigurationFailureSidelink* content in Proposal C-5 in [1], *together with* the AS configuration failure procedure not having been concluded from the email discussion [2] (specifically related to Proposal 4 and 5 therein). The discussion on the content of *RRCReconfigurationFailureSidelink* message comes first.

* **Question 5:** What information should be included in *RRCReconfigurationFailureSidelink* from the RX UE to the TX UE?

1. A failure type of “AS configuration failure” is included;
2. The SLRB configurations (signaled in the RRCReconfigurationSidelink from the peer UE) that caused the AS configuration failure are included;
3. Nothing is included, keeping RRCReconfigurationFailureSidelink as an empty message.

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| **Companies are invited to provide views below for Question 5** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | c | b) is not correct since AS configuration failure includes ASN.1 decoding error, in which case it is infeasible to judge the IE mapping. Furthermore, AS-layer configuration may further involve in later releases to configure not only SLRB, but also MAC/PHY parameters, so limit the error cause to SLRB is not future proof.  For a), it is not clear how to further split AS configuration failure into different category, i.e., no clear motivation to define different failure cause at least in R16. |
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**Result and Conclusion of Q5:**

Based on Monday on-line discussion, regarding what TX UE should do upon receiving *RRCReconfigurationFailureSidelink*, Option C, i.e. up to UE implementation, has already been out; also, based on the atmosphere of the on-line discussion, it seems that Option B, i.e. report a new failure cause to the NW, received the support of a majority of companies. For the sake of progress, therefore, below question tentatively asks whether tOption 2 in [2] can be accepted as a way forward at this stage.

* **Question 5a**: As per on-line discussion on Monday, do companies now agree that the TX UE reports a new failure cause to the NW upon the reception of *RRCReconfigurationFailureSidelink* from the RX UE?

1. Yes.
2. No. If this option is selected, please clarify the reason and specify other solutions (in detail).

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| **Companies are invited to provide views below for Question 5a** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | b) | As commented online, one cannot perform reporting for IDLE/INACTIVE/OOC UE anyway.  For CONNECTED UE, our first preference is to align with IDLE/INACTIVE/OOC UE as well, since there is anyway scenarios where the failure cannot be solved by reporting, e.g., in case the network does not respond with an updated configuration (similar to the IDLE/INACTIVE/OOC where UE relies on fixed SIB/pre-configuration). |
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**Result and Conclusion of Q5a:**

* **Question 5b**: If Option a) is selected in Q5a, how does the TX UE deal with the failing SLRB(s) included in the AS configuration failure message (if any)?

1. Release them.
2. Continue using them.

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| **Companies are invited to provide views below for Question 5b** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | Discuss the UP behavior for AS-layer configuration failure, but not limited to SLRB configuration failure. | Although we respond b) to Q5a, this is our comment to Q5b:  The premise of Q5b is that AS configuration failure is only caused by SLRB configuration, yet as responded in Q5, it is not future-proof to assume that the failure is only for SLRB configuration, i.e., it may be caused by MAC/PHY configuration that could be included in AS-layer configuration later.  So it would be more future-proof to discuss the UP behavior for AS-layer configuration failure, but not limited to SLRB configuration failure. |
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**Result and Conclusion of Q5b:**

### Discussion on Proposal C-6 – RLC AM SLRB release

The below question is to collect companies’ views on Proposal C-6 in [1]. It is about how to release the SLRB configuration provided by the gNB only for RLC AM status reporting. The specific issue is that, the configuration of the peer UE’s SLRB used for RLC AM feedback transmission is triggered by the initiating UE, and the release of this SLRB is also triggered by the reception of the SLRB release signalling in *RRCReconfigurationSidelink* from the initiating UE. However, when the SLRB is released, the peer UE will not report to its own gNB, as the SLRB release is not due to the termination of any PC5 QoS flows in the upper layers, so that the peer UE’s gNB will not know such release without SUI reported by the peer UE and thus cannot release the SLRB configuration properly.

* **Question 6**: When a peer UE receives the release of an RLC AM/UM SLRB via PC5-RRC from the initiating UE, should it report the release of this SLRB to its own gNB?

1. Yes, by excluding the entry in the *sl-RLC-ModeIndicationList* corresponding to the released SLRB in SUI.
2. No, no need to deal with this issue.

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| **Companies are invited to provide views below for Question 6** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | a) | It is straightforward to act as the counterpart procedure we agreed in R2#108, i.e., we agreed for the reporting for SLRB establishment in R2#108, and the corresponding procedure is needed for SLRB release. |
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**Result and Conclusion of Q6:**

### Discussion on Proposal C-7 – Handling of SL configuration during state transition

The below question is to collection companies’ vies on proposal C-7 in [1]. It is related to how to handle the SL configuration during the state transition, and the specific issue is “whether such handling during state transition should be supported as full configuration operation”. Specifically, the question below asks whether this is needed, and take one step forward to ask such full configuration is applied to which specific cases and involve what specific SL related configurations (if regarded as needed).

* **Question 7**: Does the SLRB handling during the state transition need to be supported as the full configuration operation?

1. Yes. If this option is selected, please clarify such full configuration applies to which specific cases and involves which specific SL related configurations.
2. No, it is up to UE implementation how to address this issue.

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| **Companies are invited to provide views below for Question 7** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | a) | The scenario is that   * When Tx-UE switch between dedicated RRC / SIB / pre-configuration; * When Tx-UE switch between SIB:s;   In the above scenario(s), Tx-UE cannot get delta-configuration when changing from old-configuration to new-configuration, which means that Tx-UE experience a full-configuration on Uu interface, and the issue is how to reflect the full-configuration on PC5 interface. It is straightforward to reflect such behaviour on PC5 via full-configuration as well, considering the following reasons (which is also the main reason that full-configuration is used in legacy Uu system):  - Firstly, some parameters cannot be changed after DRB re-established. For example: 1) for SDAP, SDAP header presence/absence are not reconfigurable after DRB setup, and 2) for PDCP, SN length, integrity protection and ciphering are not reconfigurable after DRB setup. For these type of parameter, the reconfiguration can only be implemented by SLRB release and add, i.e., full configuration.  - Secondly, full configuration is necessary to handle the configuration between different releases of NR-V2X. In other words, in case old-configuration is based on Rel-x NR-V2X, while new-configuration is based on Rel-y NR-V2X, full configuration is needed. |
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**Result and Conclusion of Q7:**

### Discussion on Proposal C-8 – PC5-S connection vs. PC5-RRC connection

The below question is to discuss proposal C-8 in [1]. It is related to the clarification on a previous RAN2 agreement “For a pair of UEs performing unicast communication, PC5-S connections and PC5 RRC connections are 1 to 1 mapping”, as some companies think the wording of this agreement is literally not aligned with SA2’s latest progress in TS 23.287 on PC5-S connection in the upper layers. It has been clarified in [1] that the true intention of this agreement on the relationship between PC5-S connection and PC5-RRC connections was to decide how to the model *PC5-RRC connection* in the AS (so as to avoid further introducing a so called *“UE ID” in the AS* @RAN2 #107bis), but *NOT* to decide how the PC5-S connection in the upper layers is configured/maintained (which should be an SA2-decided issue). Therefore, with the PC5-RRC connection agreed by RAN2 as an AS connection between a pair of SRC L2 ID and DST L2 ID, as already indicated in the earlier LS to SA2/RAN1 and now specified in TS 38.331 running CR [5], it is fully up to SA2 on whether to have more than one PC5-S connections in the upper layers on a PC5-RRC connection, and this seem to be pure upper layer issues without obvious AS impacts. As a result, it seems that only a clarification is needed on the relationship of PC5-S connection vs. PC5-RRC connection in the upper layers.

* **Question 8**: Do companies agree that it is up to SA2 whether more than one PC5-S connections can be associated with a PC5-RRC connection (which was agreed and specified as an AS connection between a pair of SRC L2 ID and DST L2 ID by RAN2)?

1. Yes.
2. No. If this option is selected, please clarify the reason.

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| **Companies are invited to provide views below for Question 8** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | No need to revisit this issue, i.e., neither LS is needed and nor RAN2 spec impact. | Our understanding is that RAN2 has previously discussed the one-to-many mapping between PC5-RRC link and PC5-S link, for which we concluded that there would be only one-to-one mapping.  For SA2, our understanding is that SA2 has not intention to go this one-to-many mapping either – specifically, by reading the related paper, seems the issue is caused by the interperation that there is a one-to-two mapping between PC5-RRC and PC5-S for IP and non-IP traffic, but by checking SA2 spec:   1. According to the following description, L2-ID and APP-layer ID is one-to-one mapping      1. According to the following text and figure, a “unicast link” in SA2 is defined for a APP-layer ID pair, i.e., unicast link and APP-layer-ID-pair is one-to-one mapping      1. Then according to the following sentence, each unicast link is for a single NW layer protocol, i.e., IP/non-IP     So there is one-to-one mapping between L2-ID – APP-layer ID – unicast-link – NW-layer-protocol, so there is no chance for a single pair of L2-ID to carry more than one NW-layer protocol. |
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**Result and Conclusion of Q8:**

### Discussion on Proposal C-9 – SRC L2 ID in SUI or not

The below question is to collect companies’ views on proposal C-9 in [1]. It is related to whether to report the SRC L2 ID in the SUI, along with the DST L2 ID. Note that even if the reporting SRC L2 ID itself can be agreed, at this stage of Relase-16 it is not desirable to perform further enhancements (e.g. some enhancement based on the gNB awareness of the paring relation between two UEs) based on that. So this point is still to be confirmed in the below questions.

* **Question 9**: Does the SRC L2 ID also need to be reported in the SUI?

1. Yes. If this option is selected
2. No.

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| **Companies are invited to provide views below for Question 9** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | B | Since the flow-ID (which is used for SDAP configuration) is defined in SUI is a per-UE manner, i.e., it would not reused for different destination UE, even if there is a case of different source address for a same destination address (which we do not agree as a valid scenario), there should be no ambiguity for SDAP configuration.  For other reasons like gNB awareness of UE pairing, the motivation has to be clarified first – from our perspective, which seems not a critical issue at current stage anyway. |
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**Result and Conclusion of Q9:**

* **Question 9a**: If “yes” is selected in Q9, do companies agree that no other enhancements based on the reporting of SRC L2 ID should be further pursued in this release (e.g. enhancements with gNB awareness of the pairing of two UEs), besides the reporting of SRC L2 ID itself?

1. Yes.
2. No.

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| **Companies are invited to provide views below for Question 9a** | | |
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**Result and Conclusion of Q9a:**

### Discussion on Proposal C-10/10a – SIB size reduction or not

The below question is to collect companies’ views on proposal C-10/10a in [1]. It is related to whether SIB size reduction should be done for the NR SL specific SIB in various cases. For this issue, since only one company provided calculation of the current SIB size, perhaps the most RAN2 can do in this meeting is to attempt to discuss the need of it. Therefore, the below question only covers the need itself. IT should be noted that, at least until now, even the need of SIB reduction has not been sufficiently analysed by companies’ documents, not mentioning the solutions on how to do it. Therefore, even if the SIB size reduction were to really be determined as needed, it could only be done in April/May meeting as ASN.1 correction, not possibly in this meeting or before March

**Question 10**: In SIB size reduction needed for the NR SL specific SIB?

1. Yes, but should only be done in the ASN.1 correction phase (i.e. in April/May, not before March);
2. No at least for the time being, with the need FFS in April/May;
3. No, not needed at all;
4. Others.

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| **Companies are invited to provide views below for Question 10** | | |
| **Companies** | **Preferred options** | **Comments if any** |
| OPPO | It is a critical issue for inter-RAT scenario, but OK with a) | As calculated in our paper, the SIB size is obviously out of the limit for LTE SIB, i.e., in case of LTE Uu controlling NR SL scenario, there is no way to use the current ASN.1 definition, which means inter-RAT support would not be feasible for R16 – that is not a preferred result for sure. Our proposal is to employ the DL segmentation, which has been used for CMAS/ETWS and DL DCCH as well.  For intra-RAT scenario, it is also worth to remove the redundant part, to ensure the SIB size can be fit into 24PRB case (the minimum one in 24/48/96 cases).  So we would like to encourage companies to look into this issue as soon as possible, and at least solve this issue before ASN.1 frozen. |
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**Result and Conclusion of Q10:**

# Conclusion

To be added later…

# Reference

1. R2-2002093 Summary document of AI 6.4.2.1 – RRC aspects Huawei, HiSilicon
2. R2-2000757 Summary of email discussion [108#44][V2X] - Miscellaneous RRC issues for 5G V2X with NR Sidelink Huawei, HiSilicon