**3GPP TSG-RAN WG2 Meeting #119 electronic *Draft*\_R2-2208844**

**Online, August, 2022**

**Source: vivo**

**Title:** **Summary of [AT119-e][504][V2X/SL] 38.321 corrections (vivo)**

**Agenda Item:** **5.2.3**

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

# Introduction

This contribution summarizes the Phase-1 discussion of the following offline discussion:

* [AT119-e][504][V2X/SL] 38.321 corrections (vivo)

**Scope:** Discuss proposed corrections in R2-2207659, R2-2207661, R2-2207663/R2-2207664/R2-2207666, R2-2208047, and the agreement made from R2-2208352 (including need of corrections and detailed wording).

**Intended outcome:** 38.321 CR on SL-BSR format in R2-2208840/R2-2208841, 38.321 CR on other corrections in R2-2208842/R2-2208843, and discussion summary in R2-2208844 (if needed). Email approval.

**Deadline**: 8/23 13:00 (UTC)

# Discussion on SL MAC CE handling ([1][2])

**Necessity of Change**

As per [1], the reason for change is cited as follows:

|  |  |
| --- | --- |
| ***Reason for change:*** | SL CSI reporting MAC CE carries the information used by L1. Thus, when the MAC entity receives the SL CSI reporting MAC CE, the information included should be indicated to the lower layer. However, in the current MAC Spec, the handling of the SL CSI reporting MAC CE upon reception by the MAC entity is missing.  In Rel-15, there were similar discussions on whether to specifiy how the MAC entity handles the received DL MAC CEs that were introduced by RAN1 to carry MIMO related information used in L1 (e.g. SP CSI-RS/CSI-IM Resource Set Activation/Deactivation MAC CE, Aperiodic CSI Trigger State Subselection MAC CE, etc.). The final decision was to specify the UE behaviour for the handling of these DL MAC CE carrying L1 information, when they are received by the MAC entity, as currently specified in subclause 5.18. Hence, similar to those DL MAC CEs carrying L1 information related to MIMO, how the MAC entity handles the SL CSI reporting MAC CE received in sidelink also needs to be specified in the MAC Spec. |

And as per [2] (mirror of [1]), Inter-UE Coordination Information MAC CE and Inter-UE Coordination Request MAC CE introduced in Rel-17 are facing the same situation.

The key point here is that the handling of a received SL MAC CE faces the same situation as the reception of a DL MAC CE carrying L1 information (e.g. those for MIMO). With Rel-15 having decided to specify UE behaviors on how to handle these DL MAC CEs, same principle should be applied to those SL MAC CEs carrying L1 info as well.

**Question 1-1:**  Do you agree that it is necessary to specify the UE behavior on how to handle the received SL MAC CE for SL CSI Reporting MAC CE (R16&R17), for Inter-UE Coordination Information MAC CE (R17) and for Inter-UE Coordination Request MAC CE (R17)?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments if any** |
| OPPO | No | Seems not necessary since it is UE internal behavior |
| xiaomi | No | We think this is some kind of inter UE action between PHY and MAC. Can be left to UE implementation. No specification change is needed. |
| vivo | Yes | Proponent. But fine to follow the majority’s view. |
| Lenovo | No | Can be left to UE implementation |
| Apple | No | It is fine to just left to UE implementation. Nothing is really broken. |
| NEC | Yes | It would be good to make the spec clearer and easy to read/understand. |
| Qualcomm | No | Share the view expressed by Apple and Lenovo |
| CATT | Yes | The same principle should be followed. |
| LG | No | Agree with OPPO |
| Nokia | Yes | The same principle can be kept. |
| ASUSTeK | Yes | Similar to other MAC CEs with L1 info. |
| ZTE | No | Not necessary to do this. |
| Ericsson | No | Changes seems unnecessary, but also fine to follow the majority view |

**Views on the CRs**

**Question 1-2:**  If “Yes” is selected for Q1-1, can the changes proposed in [1] and [2] be agreed?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Company** | **Use a “√” to select one of the below** | | | **Suggested changes**  **(if you think the CRs need revising or are not agreeable)** |
| **Agreeable w/o revision** | **Agreeable with revision** | **Not agreeable** |
| NEC | **√** |  |  |  |
| CATT | **√√** |  |  |  |
| Nokia |  | **√** |  | Some simplification can be done. Suggestion is:  5.18.X Sidelink CSI Reporting MAC CE  A UE may provide the sidelink CSI information to the peer UE by sending the Sidelink CSI Reporting MAC CE described in clause 6.1.3.35.  Upon reception of a Sidelink CSI Reporting MAC CE, the MAC entity shall:  - indicate to lower layers the information regarding the Sidelink CSI Reporting MAC CE.  5.18.Y Inter-UE Coordination Information MAC CE  A UE may provide the inter-UE coordination information to the peer UE by sending the Inter-UE Coordination Information MAC CE described in clause 6.1.3.53.  Upon reception of a an Inter-UE Coordination Information MAC CE, the MAC entity shall:  - indicate to lower layers the information regarding the Inter-UE Coordination Information MAC CE.  5.18.Z Inter-UE Coordination Request MAC CE  A UE may request inter-UE coordination information from the peer UE by sending the Inter-UE Coordination Request MAC CE described in clause 6.1.3.54.  Upon reception of an Inter-UE Coordination Request MAC CE:  - indicate to lower layers the information regarding the Inter-UE Coordination Request MAC CE. |
|  |  |  |  |  |
|  |  |  |  |  |

[Summary] As per companies’ comments to above Q1-1 and Q1-2, it is seen that there is a majority of companies who would like to leave it to UE implementation on how to handle the received SL MAC CEs without Spec impact. Other companies commented that a change is preferable to get a consistent specification style with the DL MAC CE reception.

Considering that there is no clear majority to support the change and UE implementation specific way can do work, Rapporteur proposes to not pursue the CRs in [1] and [2].

**Proposal 1: The CRs in R2-2207659 and R2-2207660 are not pursued.**

# Discussion on *sl-HARQ-FeedbackEnabled* ([3][4])

**Necessity of Change**

As per [3][4], the reason for change is cited as follows:

|  |  |
| --- | --- |
| ***Reason for change:*** | In subclause 5.22.1.4.1.2, the condition on the SL LCP restriction for sl-HARQ-FeedbackEnabled is now specified as a sub-level condition under the umbrella of the SL LCP restriction for SL CG sl-AllowedCG-List. This means that the condition on the SL LCP restriction for sl-HARQ-FeedbackEnabled only takes effect in SL CG case, and depends on whether the condition on the SL LCP restriction for sl-AllowedCG-List is satisfied or not.  However, this is obviously not the case, as the SL LCP restriction for sl-HARQ-FeedbackEnabled is not subject to the SL CG case, but applies to dynamic SL grant as well. That is to say, the current condition on the SL-LCP restriction for sl-HARQ-FeedbackEnabled is specified at a wrong level, and should have been specified at the same level as all the other SL LCP restrictions (i.e. at the level “2>”). |

The key point here is that the condition on SL LCP restriction *sl-HARQ-FeedbackEnabled* is now specified at a wrong level, as if it is a sub-level condition depending on the SL LCP restriction *sl-AllowedCG-List.*

**Question 2-1:**  Do you agree that the condition of SL LCP restriction *sl-HARQ-FeedbackEnabled* is now specified at a wrong level and thus needs to be corrected?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments if any** |
| OPPO | Yes |  |
| xiaomi | No | Based on our understanding, when all the level 2 condition is satisfied, UE will check the HARQ condition. It does not mean the HARQ condition only applies to CG, e.g., if CG is not configured and the other two level 2 conditions are all fulfilled, UE will also check this HARQ condition. Please note we use “and” and there is “if configured” in the last two level 2 conditions.    Also, if the HARQ condition removes as proposed, the “else” is confused as there are many parallel level 2 conditions and it is not clear which condition does “else” refer to, e.g., based on the proposed change, even if SL data is not available for a LCH, UE will enter the else brunch and *sl-HARQ-FeedbackEnabled* is set to disabled, which is not correct. |
| vivo | Yes | Even if the situation is as what Xiaomi explained above, it is still desirable to change the level of the conditions of the *sl-HARQ-FeedbackEnabled* to the right level, as it is obvious that those conditions should be at the same level as other LCP restrictions (level “2>”), but are now put at a wrong level (even if just literally speaking). |
| Lenovo | No | Firstly, our understanding is that current text is not broken consider the operation is per-SL grant:   1. If the SL grant is for non-CG: then *sl-AllowedCG-List* condition will not be fulfilled 2. If the SL grant is for CG: then CG conditions may be fulfilled   So if the SL grant is for DG, the feedback setting procedure can be entered.  On the other hand, for the level of the condition, we are fine to have at the same level as other restrictions (level 2) as other restrictions. |
| Apple | Yes | Agree with OPPO and vivo |
| NEC | Yes |  |
| Qualcomm | No | We share views expressed above (we do not see the current spec is broken). |
| CATT | Yes | The current level for SL LCP restriction sl-HARQ-FeedbackEnabled should be promoted. |
| LG | No | Because there is “if configured” in 2nd if level, current text covers DG case. |
| Nokia | Yes | Although the current text covers DG cases, the conditions with wrong levels need to be corrected. In the meanwhile, having a condition starting with 'if' with the same level of another condition starting without 'if' seems not a good way, especially when the condition starting with 'if' has another low-level conditions and 'else' part. Our suggestion is provided to Q2-2. |
| ASUSTeK | Yes | The current text may not be broken, but it’s beneficial to have the condition in the same level with other conditions for better readability. |
| ZTE | Yes |  |
| Ericsson | Yes | agree with VIVO, in order to make the logical to be more clear, suggest the proposed changes. |

**Views on the CRs**

**Question 2-2:**  If “Yes” is selected for Q2-1, can the changes proposed in [3] and [4] be agreed?

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| --- | --- | --- | --- | --- |
| **Company** | **Use a “√” to select one of the below** | | | **Suggested changes**  **(if you think the CRs need revising or are not agreeable)** |
| **Agreeable w/o revision** | **Agreeable with revision** | **Not agreeable** |
| OPPO | **√** |  |  |  |
| Apple | Yes |  |  |  |
| NEC | **√** |  |  |  |
| CATT | **√** |  |  |  |
| Nokia |  | **√** |  | 1> select the logical channels satisfying all the following conditions among the logical channels belonging to the selected Destination:  2> SL data is available for transmission; and  2> *sl-configuredGrantType1Allowed*, if configured, is set to *true* in case the SL grant is a Configured Grant Type 1; and.  2> *sl-AllowedCG-List*, if configured, includes the configured grant index associated to the SL grant; and  2> *sl-HARQ-FeedbackEnabled* is set to *enabled*, if *sl-HARQ-FeedbackEnabled* is set to *enabled* for the highest priority logical channel satisfying the above conditions and PSFCH is configured for the sidelink grant associated to the SCI; and  2> *sl-HARQ-FeedbackEnabled* is set to *disabled*, if *sl-HARQ-FeedbackEnabled* is set to *disabled* for the highest priority logical channel satisfying the above conditions and if PSFCH is configured for the sidelink grant associated to the SCI; and  2> *sl-HARQ-FeedbackEnabled* is set to disabled if PSFCH is not configured for the sidelink grant associated to the SCI. |
| ZTE | **√** |  |  |  |
| Ericsson | **√** |  |  |  |

[Summary] The discussions on above Q2-1 and Q2-2 are summaries as follows:

* There is a majority of companies (9 out of 13) who confirms the need of change to correct the level of the SL LCP restriction condition on *sl-HARQ-FeedbackEnabled*;
* There is one company who selected “No” in Q2-1, but commented that they are fine to change the condition level of s*l-HARQ-FeedbackEnabled* into the same level as other conditions, with some clarifications actually on their understanding against the reason of change stated by the CRs.
* The other 3 companies commented that the current descriptions work, so don’t want any change to be made.

Considering the majority’s view that are fine with the change, Rapporteur proposes to agree on the intention of the CRs in [3] and [4], and change the condition of SL LCP restriction on *sl-HARQ-FeedbackEnabled* to the appropriate level. Also, considering some companies’ concerns on using “if” conditions in parallel with other SL LCP restrictions (as expressed in Q2-2), the CRs in [3] and [4] need to be revised to accommodate such “if” conditions involved in the SL LCP restriction on *sl-HARQ-FeedbakcEnabled* into a more compatible way.

**Proposal 2-1: Agree the intention of the CRs in R2-2207661 and R2-2207662, and upgrade SL LCP restriction condition on *sl-HARQ-FeedbackEnabled* into the same level as other SL LCP restrictions.**

**Proposal 2-2: Revise the CRs to make the “if” conditions better adapt into the descriptions style of the SL LCP subclause.**

# Discussion on SL-BSR format ([5]-[9])

**Necessity of Change**

As per the observations listed in [5], the problem is identified by Observation 3 cited as follows:

**Observation 3 If the number of Buffer Size fields that is reported in a SL-BSR or a Truncated SL-BSR is zero, only one Octet is needed, which cannot be covered by the format currently specified in Figure 6.1.3.33-1 for Oct 2N.**

In summary, it means that “*the NOTE in subclause 6.1.3.33 is incompatible with the current SL-BSR/Truncated SL-BSR formats specified in Figure 6.1.3.33-1*” (see below).

|  |
| --- |
| 6.1.3.33 Sidelink Buffer Status Report MAC CEs  Sidelink Buffer Status Report (SL-BSR) MAC CEs consist of either:  - SL-BSR format (variable size); or  - Truncated SL-BSR format (variable size).  SL-BSR and Truncated SL-BSR MAC control elements consist of one Destination Index field, one LCG ID field and one corresponding Buffer Size field per reported target group.  The SL-BSR formats are identified by MAC subheaders with LCIDs as specified in in Table 6.2.1-2.  The fields in the SL-BSR MAC CE are defined as follows:  - Destination Index: The Destination Index field identifies the destination. The length of this field is 5 bits. The value is set to one index corresponding to *SL-DestinationIdentity* associated to same destination reported in *SL-TxResourceReqList*. The value is indexed sequentially from 0 in the same ascending order of *SL-DestinationIdentity* in *SL-TxResourceReqList* as specified in TS 38.331 [5];  - LCG ID: The Logical Channel Group ID field identifies the group of logical channel(s) whose SL buffer status is being reported. The length of the field is 3 bits;  - Buffer Size: The Buffer Size field identifies the total amount of data available according to the data volume calculation procedure in TSs 38.322 [3] and 38.323 [4] across all logical channels of a logical channel group of a destination after the MAC PDU has been built (i.e. after the logical channel prioritization procedure, which may result the value of the Buffer Size field to zero). The amount of data is indicated in number of bytes. The size of the RLC headers and MAC subheaders are not considered in the buffer size computation. The length of this field is 8 bits. The values for the Buffer Size field are shown in Table 6.1.3.1-2, respectively. For the Truncated SL-BSR format the number of Buffer Size fields included is maximised, while not exceeding the number of padding bits.  Buffer Sizes of LCGs are included in decreasing order of the highest priority of the sidelink logical channel having data avaialble for transmission in each of the LCGs irrespective of the value of the Destination Index field.  NOTE: The number of the Buffer Size fields in the SL-BSR and Truncated SL-BSR format can be zero.    **Figure 6.1.3.33-1: SL-BSR and Truncated SL-BSR MAC control element** |

**Question 3-1:**  Do you agree that the NOTE in 6.1.3.33 is incompatible with the current SL-BSR/Truncated SL-BSR formats specified in Figure 6.1.3.33-1 (i.e. current specified formats cannot support a reported SL-BSR/Truncated SL-BSR w/o any BS field)?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments if any** |
| OPPO | Yes |  |
| xiaomi | See comments | Not sure if there is anything really broken but are fine to follow the majority. |
| vivo | Yes | Proponent. Just to clarify more: the SL-BSR/Truncated SL-BSR format now included in current Figure 6.1.3.33-1 only supports even number of bits (i.e. 2N), and the can only “*consist of one Destination Index field, one LCG ID field and one corresponding Buffer Size field* ***per reported target group***” (see **paragraph 2** in the above citation).  So once a UE reports a SL-BSR/Truncated BSR, it can neither report a one-byte SL-BSR/Truncated BSR, nor a SL-BSR/Truncated BSR that includes only DST Index and LCG ID w/o BS field. This is contradictory to the above NOTE, which however says a SL-BSR/Truncated SL-BST w/o BS field is allowed. So a change is necessary to eliminate such contradiction (no matter Opt 1 or 2). |
| Lenovo | Yes |  |
| Apple | Yes |  |
| NEC | Yes |  |
| Qualcomm | See comment | Share the view expressed by Xiaomi |
| CATT | Yes |  |
| LG | Yes |  |
| Nokia | No | N is the number of LCGs for which BS is being reported and the NOTE is just saying that even when LCG ID exists, its corresponding BS field may not exist. In other words, the NOTE says Oct 2N may not exist even if Oct 2N-1 exists. So, we see no contradiction between the format description and the NOTE.  [Rapp] Clarification: please refer to the above cyan-highlighted paragraph for information. For SL-BSR/Truncated SL-BSR, it requires that as long as a target group is reported, **all of** the DST Index, the LCG ID and the **corresponding BS field** need to be included. In other words, there is no case for a SL-BSR/Truncated SL-BSR that “*even when LCG ID exits, its corresponding BS field may not exist*” as said above.  Note that even for NR Uu BSR, we don’t have a separate format description for the Long BSR when BS field is omitted.  [Rapp] that is because the size of Long BSR can be 1, 2, 3, …, m+1 bytes, i.e. it can have either even number of bytes or odd number of bytes. But here, the figure 6.1.3.33-1 explicitly shows that the size of SL-BSR/Truncated BSR can only be 2N bytes, which must be even number of bytes. If one intends to have odd number of bytes, another figure must be introduced. |
| ASUSTeK | See comments | We are not sure when the UE will report a one-octet SL-BSR/Truncated BSR (with DST/LCG octet without its corresponding buffer size). If there’s no data available to report for any destination, the SL-BSR would be empty (with neither destination/LCG nor buffer size octet) and the size of the MAC CE would be 0 (which is an even number). We can follow majority’s view if anything needs to be fixed. |
| ZTE | See comments | Does UE need to report zero buffer? And actually, current buffer index support zero buffer size with index set to 0.  Accroding to current MAC spec, only data available LCH needs to be reported:   |  | | --- | | For Regular and Periodic SL-BSR, the MAC entity shall:  1> if *sl-PrioritizationThres* is configured and the value of the highest priority of the logical channels that belong to any LCG and contain SL data for any Destination is lower than *sl-PrioritizationThres*; and  1> if *ul-PrioritizationThres* is configured and the value of the highest priority of the logical channels that belong to any LCG and contain UL data is equal to or higher than *ul-PrioritizationThres* according to clause 5.4.5:  2> prioritize the LCG(s) for the Destination(s).  1> if the Buffer Status reporting procedure determines that at least one BSR has been triggered and not cancelled according to clause 5.4.5 and the UL grant cannot accommodate an SL-BSR MAC CE containing buffer status only for all prioritized LCGs having data available for transmission plus the subheader of the SL-BSR according to clause 5.4.3.1.3, in case the SL-BSR is considered as not prioritized:  2> prioritize the SL-BSR for logical channel prioritization specified in clause 5.4.3.1;  2> report Truncated SL-BSR containing buffer status for as many prioritized LCGs having data available for transmission as possible, taking the number of bits in the UL grant into consideration.  1> else if the number of bits in the UL grant is expected to be equal to or larger than the size of an SL-BSR containing buffer status for all LCGs having data available for transmission plus the subheader of the SL-BSR according to clause 5.4.3.1.3:  2> report SL-BSR containing buffer status for all LCGs having data available for transmission.  1> else:  2> report Truncated SL-BSR containing buffer status for as many LCGs having data available for transmission as possible, taking the number of bits in the UL grant into consideration.  For Padding SL-BSR:  1> if the number of padding bits remaining after a Padding BSR has been triggered is equal to or larger than the size of an SL-BSR containing buffer status for all LCGs having data available for transmission plus its subheader:  2> report SL-BSR containing buffer status for all LCGs having data available for transmission;  1> else:  2> report Truncated SL-BSR containing buffer status for as many LCGs having data available for transmission as possible, taking the number of bits in the UL grant into consideration. | |
| Ericsson | Yes |  |

**Views on the CRs**

Two options are provided in [5], respectively corresponding to CRs in [6][7] (Opt.1) and CRs in [8][9] (Opt.2).

Option 1 keeps the NOTE and adds a new SL-BSR/Truncated SL-BSR format, with the purpose to adapt the SL-BSR/Truncated SL-BSR formats to the NOTE. Option 2 removes the NOTE, with the purpose to adapt the description texts to the current SL-BSR/Truncated SL-BSR formats.

**Question 3-2:**  If “Yes” is selected for Q3-1, which option do you prefer to fix the issue in Q3-1?

* **Option 1**: Keep the NOTE and add a new SL-BSR/Truncated SL-BSR format, with only one byte including a pair of {DST Index, LCG ID}.
* **Option 2**: Remove the NOTE and keep the current SL-BSR/Truncated SL-BSR format in Figure 6.1.3.33-1.

|  |  |  |
| --- | --- | --- |
| **Company** | **Option Selection** | **Comments, if you prefer other options** |
| OPPO | Option 2 |  |
| xiaomi | Option 2 | If companies would like to have some change, we slightly prefer option 2. |
| Lenovo | Option 2 |  |
| Apple | Option 2 |  |
| NEC | Option 2 |  |
| Qualcomm | Option 2 | Agree with Xiaomi |
| CATT | Option2 |  |
| LG | Option 2 |  |
| Nokia | No option | Option1: As responded above, NOTE should be kept without adding any new format.  Option2: It assumes that BS field cannot be omitted, which is not correct. |
| ASUSTeK | Option 2 |  |
| Ericsson | Option 2 |  |

Depending on the option one prefers, the following questions are to check whether the related CRs are agreeable or not.

**Question 3-3:**  If “Option 1” is selected for Q3-2, can the changes proposed in [6] and [7] be agreed?

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| --- | --- | --- | --- | --- |
| **Company** | **Use a “√” to select one of the below** | | | **Suggested changes**  **(if you think the CRs need revising or are not agreeable)** |
| **Agreeable w/o revision** | **Agreeable with revision** | **Not agreeable** |
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**Question 3-4:**  If “Option 2” is selected for Q3-2, can the changes proposed in [8] and [9] be agreed?

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| --- | --- | --- | --- | --- |
| **Company** | **Use a “√” to select one of the below** | | | **Suggested changes**  **(if you think the CRs need revising or are not agreeable)** |
| **Agreeable w/o revision** | **Agreeable with revision** | **Not agreeable** |
| OPPO | **√** |  |  |  |
| xiaomi |  | **√** |  | One case is missing in the inter-operability analysis, i.e., one UE implements this CR while the other UE not. |
| Lenovo |  | **√** |  | Xiaomi has a point |
| Apple |  | **√** |  |  |
| NEC |  | **√** |  |  |
| CATT | **√** |  |  |  |
| Ericsson |  | **√** |  | Agree with xiaomi |

[Summary] The discussions on above Q3-1~ Q3-4 are summaries as follows:

* There is a majority of companies (8 out of 13) who selected “Yes” in Q3-1 and thus confirmed the existence of the problem and the need of change;
* There are another 2 companies who said OK to follow the majority’s view, and are thus fine to pursue some changes to solve the problem, considering the majority’s view observed in above bullet 1.
* There are another two companies providing comments, suspecting the use case to report a SL-BSR/Truncated SL-BSR having only DST Index and LCG ID but no BS field. Rapporteur understands that this is actually a doubt on the correctness of the NOTE itself. One of the companies is fine to follow the majority’s view as well.
* Another company did not share the problem resolved by the CRs.

About the CRs, as per the input to Q3-2 ~ Q3-4 as well as confirmation in the reflector, there is a clear majority in favor of Option 2 which directly removes the problematic NOTE in 6.1.3.33. In addition, companies are actually fine with the changes themselves provided in the CRs in [8][9], with just an additional comment to add the inter-operability statement between the two UEs in the cover sheet.

Considering the above situation, the proposals are given as follows to this SL-BSR/Truncated SL-BSR issue.

**Proposal 3-1: Option 2 in R2-2207663 is adopted, i.e. in the MAC Spec, remove the NOTE in subclause 6.1.3.33 and keep the current SL-BSR/Truncated SL-BSR format in Figure 6.1.3.33-1**

**Proposal 3-2: Agree the changes in CRs R2-2207666 and R2-2207667. Revise the cover sheet with the addition of the inter-operability statement between two UEs implementing/not implementing the CRs respectively.**

# Discussion on multiple TX pool handling ([10][11])

**Necessity of Change**

As per [10][11], the reason for change is cited as follows:

|  |  |  |
| --- | --- | --- |
| ***Reason for change:*** | RAN1 has sent RAN2 a LS of R2-2002507, where the constraint when a UE operations in multiple resource pools simultaneously is as follows:   |  | | --- | | • **Question 3**: Whether an NR V2X mode 2 UE can select multiple resource pools on single carrier from RAN1 perspective?  - **Answer**: An operation of the sensing, resource (re-)selection, and related procedures occurs in a single resource pool for transmission. A UE can be (pre-)configured with multiple resource pools in SL BWP on a carrier. The UE may perform the operations in multiple resource pools simultaneously, but can only transmit one PSCCH/PSSCH in one of them in a SL slot. On the other hand, a UE should be able to receive in multiple resource pools in SL BWP on a single carrier. |   However, this constraint has not yet been captured in spec. Considering this constraint is important from the perspective of UE development as well as operation, it should be captured in MAC spec. |

The key point here is whether there is a need to clarify how the UE transmits on the Physical channels PSCCH/PSSCH in the MAC Spec when multiple mode-2 TX pools are configured.

**Question 4-1:**  Do you think a clarification is needed in the MAC Spec on how the UE transmits on PSCCH/PSSCH when it is configured with multiple mode-2 TX pools?

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments if any** |
| OPPO | No with comments | We agree that there is a restriction that UE cannot perform simultaneously transmission in the same slot, but the simultaneously transmission in the same slot issue has been discussed in RAN1 before, and whether/how to capture this restriction in specification is concluded as no-conclusion. So we understand we should not re-open the discussion at this stage, and rely on UE implementation. |
| xiaomi | No | Seems should be captured in RAN1 spec since PHY finally decides the “transmission”. |
| vivo |  | We can follow the majority’s view. |
| Lenovo | No | Agree with OPPO and Xiaomi |
| Apple | No | This needs to be added in PHY spec. |
| NEC |  | No strong view, can follow majority view. |
| Qualcomm | No |  |
| CATT | Yes | The question is NR V2X mode 2 UE can select multiple resource pools on single carrier. This is related to the procedure of resource allocation ,it captures in R2 spec.  But with R1’s reply, they added one additional condition which is not in R2 scope (but can only transmit one PSCCH/PSSCH in one of them in a SL slot).  In general, we can accept to capture this change. |
| LG | No | Agree with OPPO |
| Nokia | No | If necessary, it can be specified in PHY. |
| ASUSTeK |  | Can follow majority |
| ZTE |  | No strong view, but tent to agree OPPO’s understanding. |
| Ericsson | No | Agree with OPPO, reopening discussion should be avoided |

**Views on the CRs**

**Question 4-2:**  If “Yes” is selected for Q4-1, can the changes proposed in [10] and [11] be agreed?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Company** | **Use a “√” to select one of the below** | | | **Suggested changes**  **(if you think the CRs need revising or are not agreeable)** |
| **Agreeable w/o revision** | **Agreeable with revision** | **Not agreeable** |
| CATT | **√** |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

[Summary] As per companies’ comments to above Q4-1 and Q4-2, there is a majority of companies (8 out of 13) which commented the changes proposed in [10] and [11] are not necessary, three other companies that were fine to follow the majority’s view and one company that thought the change is necessary. Based on the situation, the Rapporteur proposes to not pursue the changes in [10] and [11] from RAN2 perspective.

**Proposal 4: The CRs in R2-2208047 and R2-2208048 are not pursued from RAN2 perspective.**

# Discussion on the Spec impact due to UL skipping

This subclause is to deal with the left-over issue on the below agreement reached on Monday session:

|  |
| --- |
| R2-2208352 Discussion on UL skipping and SL BSR ASUSTeK discussion Rel-16 38.321 5G\_V2X\_NRSL-Core  Proposal 1A: RAN2 confirm UL skipping can be supported with sidelink UE.  Proposal 1B: RAN2 conclude that UL skipping is not allowed to be enabled in sidelink UE and capture the conclusion in meeting minutes.  [Vivo, LG, OPPO, MediaTek, Qualcomm]: UL skipping is a kind of optimization. It is not applied to SL. [Qualcomm]: No need of any correction.   * UL skipping is not applied to SL |

Specifically, the discussion is about whether any Spec impact is needed to support above agreement. It is observed from current TS 38.321 that whether UL TX skipping is enabled or not is controlled by the indicators *enhancedSkipUplinkTxDynamic* and *enhancedSkipUplinkTxConfigured* (see below citation). So strictly speaking, if there is an intention to disable this feature thoroughly for a UE with mode-1, it should be clairified in the field descriptions of the above indicators that mode-1 UE cannot be configured with them. However, somebody may be also thinking of leaving this to NW implementation, and some instructions/common understanding written down in the meeting minutes already suffice.

|  |
| --- |
| 1. if the MAC entity is configured with *enhancedSkipUplinkTxDynamic* with value *true* and the grant indicated to the HARQ entity was addressed to a C-RNTI, or if the MAC entity is configured with *enhancedSkipUplinkTxConfigured* with value *true* and the grant indicated to the HARQ entity is a configured uplink grant:   2> if there is no UCI to be multiplexed on this PUSCH transmission as specified in TS 38.213 [6]; and  2> if there is no aperiodic CSI requested for this PUSCH transmission as specified in TS 38.212 [9]; and  2> if the MAC PDU includes zero MAC SDUs; and  2> if the MAC PDU includes only the periodic BSR and there is no data available for any LCG, or the MAC PDU includes only the padding BSR:  3> not generate a MAC PDU for the HARQ entity. |

**Question 5-1:**  Do you think any Spec impact is needed to support the agreement “=> UL skipping is not applied to SL” reached on Monday?

* **Option 1**: Clarify in the field description of *enhancedSkipUplinkTxDynamic* and *enhancedSkipUplinkTxConfigured* that they will not be set as “true” for a UE configured with Mode-1.
* **Option 2**: No need of any Spec impact. Current agreement in the meeting minutes is enough.
* Others. Please clarify the details.

|  |  |  |
| --- | --- | --- |
| **Company** | **Option Selection** | **Comments, if you prefer other options** |
| OPPO | Option 2 | This is already discussed in online session. |
| Xiaomi | Option 1 | Some clarification is needed. |
| Vivo | Option 1 | We’ve slightly preference on Option 1, but can follow majority’s view. |
| Lenovo | Option 1 | Some clarification is needed. |
| Apple | See comment | WE think this can be clarified with a NOTE. |
| NEC | Option 2 |  |
| Qualcomm | Option 2 | We see no compelling reason to change the online session agreement |
| CATT | Option 2 | Same view as QC |
| LG | Option 2 | This is already discussed in online session. |
| Nokia | Option 2 | Even in the current spec, uplink skipping is not applied to the sidelink because the paragraph checks the skipping condition together with the C-RNTI and whether the received grant is configured uplink grant or not. For sidelink, dynamic grant is addressed by SL-RNTI and the configured grant is explicitly specified as configured sidelink grant. So, there is no case that those skipping conditions are passed for sidelink operation.  [Rapp] Clarification: A mode-1 UE also has C-RNTI, and it can also get UL grant scheduled by C-RNTI to transmit UL data or UL RRC signaling, e.g. SidelinkUEInformation. |
| ASUSTeK | Option 1 | It is beneficial to add clarification to avoid future discussion. |
| ZTE | Option1 |  |
| Ericsson | Option 2 |  |

[Summary] As per companies’ comments to above Q5-1 and Q5-2, the discussion situation is summarized as follows:

* There is a slight majority of companies (7 out of 12) that do not want to make any change in the RAN2 Spec, but only want to rely on the agreement in the meeting minutes.
* Among other companies:
  + 5 companies selected option 1 and preferred a restriction by normative texts as the guideline to NW configuration;
  + 1 company commented that a NOTE is preferred to normative texts.

Rapporteur’s understanding is that during Monday meeting, the common understanding was that the current Spec do has some problems to support co-working of UL skipping and SL mode-1 without any change, and the solution adopted by the agreement is to prevent them from co-working within the same UE. This means that not configuring/enabling both is the only correct way without any trouble. Considering also the situation that implementors are not assumed to read meeting minutes, it is desirable to write something in the Spec to embody this only correct way out to avoid mis-behave of the NW and the UE.

On the other hand, however, Rapporteur found that there is also the case that UL TX skipping does not depend on NW configuration (e.g. for UL CG), thus unable to be addressed simply by NW configuration, and there’s not yet been clear solution on how to address (at least) this case from the comments provided.

Considering the reluctance of the slight majority to introduce any Spec impact and the situation that a clear and complete solution on how to actually change the Spec is unavailable at the moment (even with a NOTE as proposed by some companies), Rapporteur proposes to postpone this issue and allow more time for companies to check the Spec changes that are really needed.

**Proposal 5: Postpone the discussions on what/whether Spec changes are really needed to support the agreement “UL skipping is not applied to SL”.**

# Conclusions

Thanks to companies’ input provided to this offline discussion. The proposals summarized from this offline are listed as follows:

**Proposal 1: The CRs in R2-2207659 and R2-2207660 are not pursued.**

**Proposal 2-1: Agree the intention of the CRs in R2-2207661 and R2-2207662, and upgrade SL LCP restriction condition on *sl-HARQ-FeedbackEnabled* into the same level as other SL LCP restrictions.**

**Proposal 2-2: Revise the CRs to make the “if” conditions better adapt into the descriptions style of the SL LCP subclause.**

**Proposal 3-1: Option 2 in R2-2207663 is adopted, i.e. in the MAC Spec, remove the NOTE in subclause 6.1.3.33 and keep the current SL-BSR/Truncated SL-BSR format in Figure 6.1.3.33-1**

**Proposal 3-2: Agree the changes in CRs R2-2207666 and R2-2207667. Revise the cover sheet with the addition of the inter-operability statement between two UEs implementing/not implementing the CRs respectively.**

**Proposal 4: The CRs in R2-2208047 and R2-2208048 are not pursued from RAN2 perspective.**

**Proposal 5: Postpone the discussions on what/whether Spec changes are really needed to support the agreement “UL skipping is not applied to SL”.**

# References

1. R2-2207659 CR on SL MAC CE handling vivo CR Rel-16 38.321 16.9.0 1328 - F 5G\_V2X\_NRSL-Core
2. R2-2207660 CR on SL MAC CE handling vivo CR Rel-17 38.321 17.1.0 1329 - A 5G\_V2X\_NRSL-Core
3. R2-2207661 Correction on SL LCP restriction for sl-HARQ-FeedbackEnabled vivo CR Rel-16 38.321 16.9.0 1330 - F 5G\_V2X\_NRSL-Core
4. R2-2207662 Correction on SL LCP restriction for sl-HARQ-FeedbackEnabled vivo CR Rel-17 38.321 17.1.0 1331 - A 5G\_V2X\_NRSL-Core
5. R2-2207663 Discussion on the Buffer Size field in the Sidelink BSR formats vivo discussion
6. R2-2207664 Clarification on the Buffer Size field in the Sidelink BSR formats (Option 1) vivo CR Rel-16 38.321 16.9.0 1332 - F 5G\_V2X\_NRSL-Core
7. R2-2207665 Clarification on the Buffer Size field in the Sidelink BSR formats (Option 1) vivo CR Rel-17 38.321 17.1.0 1333 - A 5G\_V2X\_NRSL-Core
8. R2-2207666 Clarification on the Buffer Size field in the Sidelink BSR formats (Option 2) vivo CR Rel-16 38.321 16.9.0 1334 - F 5G\_V2X\_NRSL-Core
9. R2-2207667 Clarification on the Buffer Size field in the Sidelink BSR formats (Option 2) vivo CR Rel-17 38.321 17.1.0 1335 - A 5G\_V2X\_NRSL-Core
10. R2-2208047 Clarification on UE handling when performing operations on multiple RPs Huawei, HiSilicon CR Rel-16 38.321 16.9.0 1364 - F 5G\_V2X\_NRSL-Core
11. R2-2208048 Clarification on UE handling when performing operations on multiple RPs Huawei, HiSilicon CR Rel-17 38.321 17.1.0 1365 - A 5G\_V2X\_NRSL-Core