**3GPP TSG-RAN WG2 Meeting #125**

**Athens, Greece, 26 February – 01 March, 2024**

**Agenda Item : 7.15.3 (NR\_SL\_enh2)**

**Source : LG Electronics Inc.**

**Title : [POST125][104][V2X/SL] MAC CR update (LG)**

**Document for : Discussion and Decision**

1. Introduction

This is a POST email discussion for MAC CR update.

* [POST125][102][V2X/SL] MAC CR update (LG)

**Scope:** Approve Rel-18 MAC CR (including [R2-2400962](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400962.zip) and agreements made RAN2#125)

**Intended outcome:** MAC CR in [R2-2401783](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2401783.zip)

**Deadline:** Short email discussion

1. Discussion

## 2.1. P2/P3 in [R2-2400515](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400515.zip): correction for LTE and NR co-channel coexistence

In the current MAC spec version, LTE and NR co-channel coexistence bas been specified as the below

5> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:

6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting;

7> when SCS of NR SL is (pre-)configured as *μ* = 1:

8> select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;

8> may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe.

For the above procedure texts, the MAC layer selects resources according to the determined amount of resources in the **first step**. In the **second step**, the MAC layer further selects the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe. In addition, the MAC layer may also additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe. The above operations in the **second step** don’t make sense. If the UE has already selected the determined amount of resources in the first step, the resources selected in the second step would overshoot the resource need.

1. The procedure texts for LTE-NR co-channel coexistence would cause resource overshoot.

To address this issue, the procedure texts in the second step need to be executed prior to the first step on random resource selection.

Therefore, we would like to make the below proposal.

**Proposal 2. Move the procedure text on selection of time and frequency resources overlapping with LTE subframe to be executed prior to the step on random resource selection.**

The corresponding spec changes are minimized.

Based on the above proposal, we have also prepared the text proposals.

**Proposal 3. Adopt the text proposal captured in clause 4.1.**

**Text proposal:**

**1st change**

**<<<<Skipped>>>>**

5> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:

6> if SCS of NR SL is (pre-)configured as *μ* = 1:

7> select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;

7> may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe;

7> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources minus the amout of selected resources overlapping with the LTE SL subframe, and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier.

6> else:

7> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier.

**<<<<Skipped>>>>**

**2nd change**

**<<<<Skipped>>>>**

6> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:

7> if SCS of NR SL is (pre-)configured as *μ* = 1:

8>select the time and frequency resources in the second of NR SL slots of NR SL slots overlapping with an LTE SL subframe to which the selected initial transmission resources belongs, or at least select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;

8> randomly select the time and frequency resources for one or more transmission opportunities from the available resources, according to the amount of selected frequency resources minus the amout of selected resources overlapping with the LTE SL subframe, the selected number of HARQ retransmissions and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

7> else:

8> randomly select the time and frequency resources for one or more transmission opportunities from the available resources, according to the amount of selected frequency resources, the selected number of HARQ retransmissions and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9].

**<<<<Skipped>>>>**

**3rd change**

**<<<<Skipped>>>>**

5> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:

6> if SCS of NR SL is (pre-)configured as *μ* = 1:

7> select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;

7> may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe;

7> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources minus the amout of selected resources overlapping with the LTE SL subframe and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting.

6> else:

7> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting.

**<<<<Skipped>>>>**

**4th change**

**<<<<Skipped>>>>**

6> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:

7> if SCS of NR SL is (pre-)configured as *μ* = 1:

8> select the time and frequency resources in the second of NR SL slots of NR SL slots overlapping with an LTE SL subframe to which the selected initial transmission resources belongs, or at least select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe.

8> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources minus the amout of selected resources overlapping with the LTE SL subframe and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources, and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9];

7>else:

8> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI by ensuring the minimum time gap between any two selected resources in case that PSFCH is configured for this pool of resources, and that a retransmission resource can be indicated by the time resource assignment of a prior SCI according to clause 8.3.1.1 of TS 38.212 [9];

**<<<<Skipped>>>>**

**Rapporteur view:** **In order to prevent (or to prevent saturation problem) the procedure of the UE selecting only the resource (“**8>may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe.**”) without selecting the resource (“**8>select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;**”) in co-channel coexistence, current text to select the resource ( “**8>may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe.**”) only after selecting the resource (“**8> select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;**”) as in the current text is correct UE behaviour based on RAN1 agreement.**

**[POST email] Q1: Does your company agree the correction of P2/P3 in [R2-2400515](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400515.zip)?**

|  |  |  |
| --- | --- | --- |
| Company | Agree / Disagree | Further comments |
| LG | Disagree | **In order to prevent the procedure of the UE selecting only the resource (“**8>may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe.**”) without selecting the resource (“**8>select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;**”) in co-channel coexistence, current text to select the resource ( “**8>may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe.**”) only after selecting the resource (“**8> select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;**”) as in the current text is correct UE behaviour based on RAN1 agreement.** |
| OPPO | Disagree | Same view as Rapp that the current text is good enough |
| Ericsson | Agree (Proponent) | I am not sure if **LG has understood the issue**.  The issue was  **Step 0:**  In the current MAC spec, the UE MAC first determines as in yellow  4> select an amount of frequency resources within the range, if configured by RRC, between *sl-MinSubChannelNumPSSCH* and *sl-MaxSubchannelNumPSSCH*  …………………………….  After this, the MAC layer further performs actions in green.  **Step 1:**  5> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:  6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting;  7> when SCS of NR SL is (pre-)configured as *μ* = 1:  8> select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe;  8> may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe.  It means that the MAC layer selects the frequency resources according to the determined amount in **Step 0**.  After this, the MAC entity further performs actions in below  **Step 2:**  7> when SCS of NR SL is (pre-)configured as *μ* = 1:  8> select the time and **frequency** resources in the first of NR SL slots overlapping with an LTE SL subframe;  8> may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe.  After Step 2, the MAC selects additonl resources in at least one NR SL slots (overlapping with LTE subframe). The question here is that, does the MAC select more additional frequency resources? If the answer is yes, in this case, the total amount of the frequency resources selected by the MAC would be equal to  The initially determined amount (of frequency resources) + n (n>=1).  This amount (of frequency resources) would be overshot, (i.e., > *sl-MaxSubchannelNumPSSCH).*  Therefore, it would be good to clarify this.  However, if the intention for co-channel scenario is to only select (additional) time resources, the existing text “select the time and **frequency** resources in the first of NR SL slots overlapping with an LTE SL subframe” would need to be improved/updated as “select the time ~~and~~ **~~frequency~~** resources in the first of NR SL slots overlapping with an LTE SL subframe”.  [Rapp] I understand the intention of the suggestion. It seems that you are concerned that the spec could be interpreted as if the UE performs 6> and 8>,8> independently. Therefore, I propose the following correction as a simpler modification than the proponent's correction.  Rapporteur suggestion on the correction:  5> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:  6> randomly select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe or may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe, when SCS of NR SL is (pre-)configured as *μ* = 1, for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting. |
| Xiaomi | Agree with comments | We understand the issue proposed by Ericsson is to avoid UE to select more resources than determined. At least according to the current specification, UE select additional time and frequency resoruces in co-channel scenario, which should be clarified. |
| Ericsson |  | For the rapporteur suggested changes, we are basically fine, however, we are uncertain if “random selection” is applicable to resource selection in co-channel scenarios. Rapp please double checks this aspect.  [Rapp] I have confirmed from our RAN1 guy that co-channel scenario is supported only for partial sensing and full sensing. |
| Sharp | Agree with comments | Agree with the intention and prefer rapporteur’s simplified change. |
| Rapp |  | It seems that above correction I suggested was incorrect.  When *μ* is 0, the UE should perform the action 6>, and when *μ* is 1, the UE should perform the action 8> and 8>, so the actions 6> and the actions 8> and 8> was separately specified in the MAC specificaion.  Therefore, text should be modified as follows:  5> if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:  6> when SCS of NR SL is (pre-)configured as *μ* = 0:  7> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier;  6> when SCS of NR SL is (pre-)configured as *μ* = 1:  7> select the time and frequency resources in the first of NR SL slots overlapping with an LTE SL subframe or may additionally select the time and frequency resources in the subsequent NR SL slot overlapping with the LTE SL subframe, and randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7], according to the amount of selected frequency resources and the remaining PDB of SL data available in the logical channel(s) allowed on the carrier, and/or the latency requirement of the triggered SL-CSI reporting.  Min-> if co-channel doesn’t support random selection, the above text need to be further updated in the above.  [Rapp] Since "5>if *sl-NRPSSCH-EUTRA-ThresRSRP-List* is configured by the RRC:" is only included in sensing-based resource selection part, the "randomly" should be kept. Additionally, since the existing 8> and 8> is based on resourcs indicated from PHY, the added "and randomly select the time and frequency resources" should also be deleted. In other words, from rapporteur’s perspective, the second correction I proposed is the correct text. |
| ZTE | Agree with comments | OK with rapporteur’s simplified change. |
|  |  |  |
|  |  |  |
|  |  |  |

**[Summary]**

## 2.2. Proposal 2 in [R2-2400270](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400270.zip): 2.2. Clarification on transmission opportunity for MCSt

------------------ Start of summary of [AT125][104] ------------------------------

As discussed in email discussion (i.e. [POST124][105][V2X/SL] Rel-18 38.321 CR), when MAC layers select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer, for MCSt of a single MAC PDU (i.e. the resources indicated by the physical layer are in form of candidate multi-slot resources consisting of consecutive slots in time domain), one transmission opportunity includes PSSCH/PSCCH transmissions in consecutive slots. The related specs text is shown as follows.

|  |
| --- |
| **TS38.214, clause 8.1.4**  The following steps are used:  1) If a number of consecutive slots is provided with a value larger than 1, the candidate multi-slot resource definition is applied. Otherwise, the candidate single-slot resource definition is applied.  […] […]  **TS38.321, clause 5.22.1.1**  5> else if the selected resource pool is not SL-PRS dedicated resource pool:  6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] which occur within the SL DRX Active time, if configured, as specified in clause 5.28.2 of the destination UE selected for indicating to the physical layer the SL DRX Active time above, according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier. |

After selection of the resources for PSSCH/PSCCH transmissions, the UE shall consider a transmission opportunity which comes first in time as the initial transmission opportunity and the rest of transmission opportunities are considered as retransmission opportunities.

|  |
| --- |
| **TS38.321, clause 5.22.1.1**  4> consider a transmission opportunity which comes first in time as the initial transmission opportunity and other transmission opportunities as the retransmission opportunities;  4> consider all the transmission opportunities as the selected sidelink grant. |

As discussed above for MCSt of a single MAC PDU, one transmission opportunity includes resources in consecutive slots in time domain and a PSSCH/PSCCH transmission occurs in each slot, resulting in that the resources in consecutive slots for the initial transmission opportunity as specified are all for initial transmission. In that case, the transmitting UE shall toggle the NDI in each slot and the receiving UE cannot perform combining when decoding the MAC PDU, since the receiving UE treats every transmission in the consecutive slots as initial transmission. It is straightforward to consider the time and frequency resource in the first slot of the transmission opportunity as the initial transmission opportunity.

|  |
| --- |
| **TS38.321, clause 5.22.1.3.1**  For each sidelink grant, the Sidelink HARQ Entity shall:  1> if the MAC entity determines that the sidelink grant is used for initial transmission as specified in clause 5.22.1.1; or  […] […]  5> consider the NDI to have been toggled compared to the value of the previous transmission corresponding to the Sidelink identification information and the Sidelink process ID of the MAC PDU and set the NDI to the toggled value; |

***Proposal 2:*** *For resource (re-)selection in case of MCSt for a single MAC PDU, the UE considers the first resource of a transmission opportunity which comes first in time as the initial transmission opportunity.*

* *Adopt the following TP#2.*

A corresponding text proposal is provided as following.

|  |
| --- |
| **TS38.321, clause 5.22.1.1 (TP#2)**  4> consider the first time and frequency resource of a transmission opportunity which comes first in time as the initial transmission opportunity and the remaining resource(s) of the transmission opportunity, if any, and other transmission opportunities as the retransmission opportunities;  4> consider all the transmission opportunities as the selected sidelink grant. |

**Rapporteur view**: When the current text (“4> consider a transmission opportunity which comes first in time as the initial transmission opportunity and other transmission opportunities as the retransmission opportunities; 4> consider all the transmission opportunities as the selected sidelink grant.”) is applied to MCSt, rapporteur does not agree with proponent's interpretation that all slots in MCSt are resources for initial transmission.MCSt's resources are still interpreted as including both Initial transmission/retransmission.

**Q7: Does your company agree the correction of proposal 2 in [R2-2400270](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400270.zip)?**

|  |  |  |
| --- | --- | --- |
| Company | Agree / Disagree | Further comments |
| LG | Disagree | When the current text (“4> consider a transmission opportunity which comes first in time as the initial transmission opportunity and other transmission opportunities as the retransmission opportunities; 4> consider all the transmission opportunities as the selected sidelink grant.”) is applied to MCSt, rapporteur does not agree with proponent's interpretation that all slots in MCSt are resources for initial transmission.MCSt's resources are still interpreted as including both Initial transmission/retransmission. |
| Sharp | Agree(Proponent) | According to rapporteur’s views, interpretation of a/one transmission opportunity for MCSt is not aligned in MAC specs. Specifically, for resource selection, as shown below,  **TS38.321, clause 5.22.1.1**  5> else if the selected resource pool is not SL-PRS dedicated resource pool:  6> randomly select the time and frequency resources for one transmission opportunity from the resources indicated by the physical layer as specified in clause 8.1.4 of TS 38.214 [7] which occur within the SL DRX Active time, if configured, as specified in clause 5.28.2 of the destination UE selected for indicating to the physical layer the SL DRX Active time above, according to the amount of selected frequency resources, the remaining PDB of SL data available in the logical channel(s), and the remaining SL-PRS delay budget of the SL-PRS transmission(s), if available, allowed on the carrier.  ‘one transmission opportunity’ refers to multi-slots resources, while for determination of initial transmission opportunity for MCSt, as shown below, ‘a transmission opportunity’ turns out to be a single-slot resource for initial transmission, which leads to mis-alignment.  **TS38.321, clause 5.22.1.1**  4> consider a transmission opportunity which comes first in time as the initial transmission opportunity and other transmission opportunities as the retransmission opportunities;  4> consider all the transmission opportunities as the selected sidelink grant.  In our understanding, interpretation of ‘a/one transmission opportunity’ should be kept aligned which means when determining the resource for initial transmission, only the first resource of one transmission opportunity (i.e. multi-slots resources) is for initial transmission. |
| Ericsson | No strong view. |  |
| OPPO | Disagree | Same view as Rapp |
| InterDigital | Disagree | Agree with Rapp. |
| Xiaomi | Agree | Agree with the observation from Sharp. |
| Vivo | Disagree | Agree with Rapporteur’s view. |
| Lenovo | Disagree |  |
| Huawei |  | Can follow majority |
| ZTE | Disagree | Agree with Rapp. |
| ASUSTeK | Disagree |  |
| Qualcomm | Disagree |  |

**[Summary]**

Out of 12 companies

Agree: 2

Disagree: 8

Follow majority view:2

**Proposal 7 (2/8). Correction of proposal 2 in [R2-2400270](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400270.zip) is re-discussed in the POST email discussion.**

------------------ End of “Summary of [AT125][104]” ------------------------------

Proponent has still concern on misalignment of “a/one transmission opportunity” has not been addressed by [AT125][104] email discussuin. Proponent think that specifically, MCSt of a single MAC PDU is implemented in MAC specs by selecting multi-slots candidate resources for one transmission opportunity, which clearly indicates one transmission opportunity in this case corresponds to resources in multiple slots. While in the very same paragraph, a transmission opportunity is considered as initial transmission opportunity which leads to situation that multi-slots candidate resources are all for initial transmission of a single MAC PDU.

**[POST email] Q2: Does your company agree the correction of proposal 2 in [R2-2400270](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400270.zip)?**

|  |  |  |
| --- | --- | --- |
| Company | Agree / Disagree | Further comments |
| LG | Follow majority view |  |
| Xiaomi | Agree |  |
| Sharp | Agree(Proponent) |  |
| ZTE | Following majority |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**[Summary]**

## 2.3 P3 in [R2-2400152](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400152.zip): Redundant procedure for TX carrier (re-)selection

----------------------------------- Start of summary of [AT125][104] email discussion --------------------------------

According to current specification, if the UE is configured with multiple carrier frequencies and has not selected a pool of resources allowed for the logical channel, it will trigger the TX carrier (re-)selection procedure first and then perform the TX resource (re-)selection check. However, during the TX resource (re-)selection check procedure, the UE will trigger TX carrier (re-)selection procedure again. In a word, if multiple carrier frequencies are configured, and if the MAC entity has not selected a pool of resources allowed for the logical channel, the UE will trigger the TX carrier (re-)selection procedure twice as shown below.

|  |
| --- |
| 5.22.1.1 SL Grant reception and SCI transmission 1> if the MAC entity has selected to create a selected sidelink grant corresponding to transmissions of multiple MAC PDUs, and SL data is available in a logical channel; or  1> if the MAC entity has selected to create a selected sidelink grant corresponding to transmission(s) of multiple SL-PRS(s), which have been triggered by the upper layer or by the reception of a SCI from a peer UE:  2> if the MAC entity has not selected a pool of resources allowed for the logical channel or SL-PRS transmission:  3> if single carrier frequency is configured:  …  Select pool of resource.  3> else (i.e. multiple carrier frequencies are configured):  4> trigger the TX carrier (re-)selection procedure as specified in clause 5.22.1.11.  2> perform the TX resource (re-)selection check on the selected pool of resources as specified in clause 5.22.1.2; 5.22.1.2 TX resource (re-)selection check If the TX resource (re-)selection check procedure is triggered on the selected pool of resources for a Sidelink process according to clause 5.22.1.1, the MAC entity shall for the Sidelink process:  …  1> if there is no selected sidelink grant on the selected pool of resources; or  …  2> if multiple carrier frequencies are configured:  3> trigger the TX carrier (re-)selection procedure as specified in clause 5.22.1.11.  2> clear the selected sidelink grant associated to the Sidelink process, if available;  2> trigger the TX resource (re-)selection.  NOTE 4: Void.  NOTE 5: Void. |

**Observation 2: If multiple carrier frequencies are configured and the MAC entity has not selected a pool of resources allowed for the logical channel, the UE will trigger the TX carrier (re-)selection procedure twice.**

**Proposal 3. If multiple carrier frequencies are configured and the MAC entity has not selected a pool of resources allowed for the logical channel, the UE will not trigger the TX carrier (re-)selection procedure during TX resource (re-)selection check in the clause 5.22.1.2. Add a if- condition for multiple carrier case in the clause 5.22.1.2 as following TP.**

|  |
| --- |
| 5.22.1.2 TX resource (re-)selection check If the TX resource (re-)selection check procedure is triggered on the selected pool of resources for a Sidelink process according to clause 5.22.1.1, the MAC entity shall for the Sidelink process:  1> if multiple carrier frequencies are configured and if the MAC entity has not selected a pool of resources allowed for the logical channel:  2> clear the selected sidelink grant associated to the Sidelink process, if available;  2> trigger the TX resource (re-)selection.  1> else:  2> if PSCCH duration(s) and 2nd stage SCI on PSSCH for all transmissions of a MAC PDU of any selected sidelink grant(s) are not in SL DRX Active time as specified in clause 5.28.3 of the destination that has data to be sent; or  2> if SL\_RESOURCE\_RESELECTION\_COUNTER = 0 and when SL\_RESOURCE\_RESELECTION\_COUNTER was equal to 1 the MAC entity randomly selected, with equal probability, a value in the interval [0, 1] which is above the probability configured by RRC in sl-ProbResourceKeep; or  2> if the pool of resources is configured or reconfigured by RRC; or  2> if there is no selected sidelink grant on the selected pool of resources; or  2> if neither transmission nor retransmission has been performed by the MAC entity on any resource indicated in the selected sidelink grant during the last second; or  2> if sl-ReselectAfter is configured and the number of consecutive unused transmission opportunities on resources indicated in the selected sidelink grant, which is incremented by 1 when none of the resources of the selected sidelink grant within a resource reservation interval is used, is equal to sl-ReselectAfter; or  2> if the selected sidelink grant cannot accommodate a RLC SDU by using the maximum allowed MCS configured by RRC in sl-MaxMCS-PSSCH associated with the selected MCS table and the UE selects not to segment the RLC SDU; or  NOTE 1: If the selected sidelink grant cannot accommodate the RLC SDU, it is left for UE implementation whether to perform segmentation or sidelink resource reselection.  2> if transmission(s) with the selected sidelink grant cannot fulfil the remaining PDB of the data in a logical or the remaining SL-PRS delay budget for SL-PRS transmission, if available channel, and the MAC entity selects not to perform transmission(s) corresponding to a single MAC PDU or SL-PRS transmission; or  2> if Sidelink consistent LBT failure is detected as specified in clause 5.31.2 in some RB set(s) of the selected resource pool that spans multiple RB sets for the logical channel, if single carrier frequency is configured; or  2> if a MAC PDU is not transmitted (i.e. initial transmission or retransmission) in any of the resources for this MAC PDU that are associated with the sidelink process for Multi-consecutive slots transmission due to the Sidelink LBT failure:  NOTE 2: If the remaining PDB is not met, it is left for UE implementation whether to perform transmission(s) corresponding to single MAC PDU or sidelink resource reselection.  NOTE 3: It is left for UE implementation whether to trigger the TX resource (re-)selection due to the latency requirement of the MAC CEs triggered according to clause 5.22.1.7 and clause 5.22.1.10.1.  3> if multiple carrier frequencies are configured:  4> trigger the TX carrier (re-)selection procedure as specified in clause 5.22.1.11.  3> clear the selected sidelink grant associated to the Sidelink process, if available;  3> trigger the TX resource (re-)selection. |

**Rapporteur view**: According to the current MAC specification, the MAC entity performs TX carrier (re-)selection procedure once when there is no selected RP and once when there is a selected RP. There seems to be no problem with the current text of the MAC specification.

**Q2: Does your company agree the proposal 3 in [R2-2400152](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400152.zip)?**

|  |  |  |
| --- | --- | --- |
| Company | Agree / Disagree | Further comments |
| LG | Agree with comment | Looking at the comments from companies in favor of modification, I think there is a need to further check whether the current text needs to be modified. I think we can discuss further whether the correction is necessary in a short email discussion. |
| Ericsson | disagree | Agree with LG. |
| OPPO | Agree with rewording suggestion | Intention agreeable, but wondering if we can fix this by adding  1> if there is no selected sidelink grant on the selected pool of resources; or  …  2> if multiple carrier frequencies are configured and the MAC entity has selected a pool of resources allowed for the logical channel:  3> trigger the TX carrier (re-)selection procedure as specified in clause 5.22.1.11.  2> clear the selected sidelink grant associated to the Sidelink process, if available;  2> trigger the TX resource (re-)selection. |
| Xiaomi | Disagree | Agree with LG. Carrier reselection is triggered when there is no selected RP and when there is selected RP, UE performs resource reselection check, if resource reselection is triggered, UE should also trigger carrier reselection. This is aligned with the following agreement.  Proposal 10: For TX carrier (re)selection triggers in NR sidelink CA, reuse the triggers for TX carrier (re)selection per sidelink process in LTE sidelink CA as follows at least for GC/BC  if the resource (re)selection is triggered with the sidelink process. |
| Vivo | Disagree | Agree with LG. |
| NEC | Disagree | Agree with LG |
| Lenovo | Diagree | Same view as LG |
| ZTE | Agree | According to current specification, if the UE is configured with multiple carrier frequencies and has not selected a pool of resources allowed for the logical channel, it will perform following two steps:  Step1: trigger the TX carrier (re-)selection procedure  Step2: perform the TX resource (re-)selection check.  After UE perform step1, the UE has selected pool of resources but hasn’t selected sidelink grant.  So during step 2, it meet the following condition:  *if there is no selected sidelink grant on the selected pool of resources*  Then the UE will trigger TX carrier (re-)selection procedure again in the step 2.  Thus, if multiple carrier frequencies are configured, and if the MAC entity has not selected a pool of resources allowed for the logical channel, the UE will trigger the TX carrier (re-)selection procedure in both step1 and step2. |
| ASUSTeK | Agree with the intention. | In LTE V2X, after TX carrier (re-)selection procedure was triggered (due to no SL grant available) and carrier(s) have been (re)selected, the UE does not go through resource (re)selection check and no duplicated carrier selection procedure is triggered. Detail wording to simplify the procedure can be further discussed. |
| Qualcomm | Agree with the intention | To avoid frequent Tx carrier selection. |

**[Summary]**

Out of 10 companies

Agree: 5

Disagree: 5

**Rapporteur summary**: Comments from companies in favor of correction are valid, I think there is a need to further check whether the current text needs to be modified. Rapporteur think RAN2 can discuss further whether the correction is necessary in a short email discussion.

**Proposal 2 (5/5). Correction of proposal 3 in [R2-2400152](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400152.zip) is further checked in the POST email discussion.**

----------------------------------- End of summary of [AT125][104] email discussion --------------------------------

**[POST email] Q3: Does your company agree the proposal 3 in [R2-2400152](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2400152.zip)?**

|  |  |  |
| --- | --- | --- |
| Company | Agree / Disagree | Further comments |
| LG | Agree with OPPO’s suggestion | Agree with OPP’s suggestion on the correction as follows:  1> if there is no selected sidelink grant on the selected pool of resources; or  …  2> if multiple carrier frequencies are configured and the MAC entity has selected a pool of resources allowed for the logical channel:  3> trigger the TX carrier (re-)selection procedure as specified in clause 5.22.1.11.  2> clear the selected sidelink grant associated to the Sidelink process, if available;  2> trigger the TX resource (re-)selection. |
| OPPO |  | Our proposed rewording seems a bit more simplified than the original proposal, but can follow majority for sure. |
| Xiaomi | Agree with comments | Now understand the motivation based on the clarification from ZTE. And OK with OPPO’s simplified text but the added text should be “and the MAC entity has not selected a pool of resources allowed for the logical channel” |
| Sharp | Agree | Agree with OPPO’s version. |
| Huawei | Agree with the original intention. | On the wording for change, can follow majority view. |
| ZTE | Agree | We agree the intention for using a simplified text. However, the OPPO’s version cannot solve the issue.  As we said above, if the UE is configured with multiple carrier frequencies and has not selected a pool of resources allowed for the logical channel, After UE perform step1, the UE has selected pool of resources but hasn’t selected sidelink grant, then during step2, it also meet the condition of:   1. if multiple carrier frequencies are configured and the MAC entity has selected a pool of resources allowed for the logical channel:   So it will also trigger TX carrier (re-)selection procedure again in the step 2.  As regard to Xiaomi’s suggestion, this issue can be solved. But it may revert the agreement of  *reuse the triggers for TX carrier (re)selection per sidelink process in LTE sidelink CA*  As we know, in LTE, the UE will triggers for TX carrier (re)selection when resource TX resource (re-)selection is triggered even if the MAC entity has selected a pool of resources allowed for the logical channel. |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

## 2.4. P3 in Correction 2 in [R2-2401488](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2401488.zip):

----------------------------------- Start of summary of [AT125][104] email discussion --------------------------------

**Reason for change:**  In section 5.22.1.1, for SL-U related description, it is natural that single carrier would be configured for SL-U feature, so “if single carrier is configured” is redundant.

**Summary of change**: In section 5.22.1.1, remove “if single carrier is configured”.

2> if Sidelink consistent LBT failure is detected as specified in clause 5.31.2 in all RB sets of the selected resource pool:

3> if *sl-HARQ-FeedbackEnabled* is set to *enabled* for the logical channel:

4> select any pool of resources configured with PSFCH resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon*, if configured and the pool(s) in which all RB sets had Sidelink consistent LBT failure detected and not cancelled.

3> else:

4> select any pool of resources among the pools of resources except the pool(s) in *sl-BWP-DiscPoolConfig* or *sl-BWP-DiscPoolConfigCommon*, if configured and the pool(s) in which all RB sets had Sidelink consistent LBT failure detected and not cancelled.

2> perform the TX resource (re-)selection check on the selected pool of resources as specified in clause 5.22.1.2;

**Q13: Does your company agree the correction 2 in [R2-2401488](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2401488.zip)?**

|  |  |  |
| --- | --- | --- |
| Company | Agree / Disagree | Further comments |
| LG | Follow majority view |  |
| Ericsson | Follow majority view |  |
| OPPO | Disagree | Safer to keep it here for now (since it is related to whether there is a case where both a legacy licensed carrier and a new SL-U carrier are configured – if yes, we have a better reason to do this change. |
| InterDigital | Agree | Unless we agree to allow SL-U together with carrier aggregation, we should remove the text. |
| Xiaomi | Agree |  |
| Vivo | Agree |  |
| NEC | Agree |  |
| Lenovo | No strong view fine to have the change |  |
| Huawei | Agree | According to WID, SL CA is intended for ITS bands. Until now, no SL-U mechanism is used in ITS bands. In other words, SL CA and SL-U are not supposed to be configured simultaneously in Rel-18. |
| ZTE | Agree |  |
| Qualcomm | Agree | Single carrier for SL-U. |

**[Summary]**

Out of 11 companies

Agree: 7

Disagree: 1

No strong view: 3

**Proposal 13 (7/1). Correction 2 in [R2-2401488](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2401488.zip) is re-discussed in the POST email discussion.**

----------------------------------- End of summary of [AT125][104] email discussion --------------------------------

**Rapporteur view**: From the MAC CR rapporteur perspective, the current MAC spec divides single carrier procedure and multiple carrier procedure using the condition “if single carrier frequency is configured” and “if multiple carrier frequencies is configured”. From an inconsistency perspective in the procedure structure, it may be desirable to keep "if single carrier frequency is configured". There is no harm in keeping the text.

**[POST email] Q4: Does your company agree the correction 2 in [R2-2401488](D:\\업무\\표준화 업무\\3GPP\\3GPP 표준회의\\Rel-18\\RAN2\\#125_2024.02\\TSGR2_125\\docs\\R2-2401488.zip)?**

|  |  |  |
| --- | --- | --- |
| Company | Agree / Disagree | Further comments |
| LG | Disagree | From the MAC CR rapporteur perspective, the current MAC spec divides single carrier procedure and multiple carrier procedure using the condition “if single carrier frequency is configured” and “if multiple carrier frequencies is configured”. From an inconsistency perspective in the procedure structure, it may be desirable to keep "if single carrier frequency is configured". There is no harm in keeping the text. |
| OPPO | Disagree | As clarified, our concern is not on the motivation of this CR, i.e., we agree so far it is limited to single carrier case. But after the proposed change, the consequence seems to be the opposite, i.e., the single-carrier restriction is removed, and it can be applied to multi-carrier case? That should happen only \*after\* R2 agree the SL-U appling to multi-carrier case, which however has not been agreed yet. |
| Xiaomi | See comments | We are OK to keep the current text until we solve the issue of coexistence between SL-U and SL CA. |
| Huawei | Agree | It is understood that SL CA and SL-U are not supposed to be configured simultaneously in Rel-18, keeping this condition which is always fulfilled (where LBT behaviour is specified) seems to be strange and unnecessary. We may add a general statement on not use SL-U and SL CA simultaneously in stage-2 or RRC specs, but not to use this condition in places for detailed UE behaviour description. |
| ZTE | Disagree with comments | If we agree that the SL-U and SL CA will not be configured for a UE at the same time, it seems redundant. However, there is no harm to keep it in this stage |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**[Summary]**

## Conclusion