**3GPP TSG-RAN WG2 Meeting #124** **R2-231**

**Chicago, USA, 13th – 17th Nov., 2023**

**Title: Email discussion on the proposed WF for MAC CR drafting**

**Source: Huawei, HiSilicon**

**Agenda item: 8.2.2**

**Document for: Discussion and Decision**

# Background

The following post meeting email discussion has been planned during RAN2#123bis:

**[Post123bis][409][POS] Rel-18 positioning MAC CRs (Huawei)**

 Scope: Review the running CRs and develop open issue lists.

 Intended outcome: Draft CRs and open issue list for next meeting

 Deadline: Medium (2 weeks)

NOTE that we have the following guidelines from the chair on the running CR email discussions

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| --- |
| Guidance for all post-meeting discussions on running CRs/open issues (also applicable to AI 7.9.1):* Update the running CR with agreements from the meeting
* Rapporteur to propose resolutions for straightforward open issues which can already be included in the running CR
* Get input on stage-3 issues that require further input from companies to make a decision:
* Focus on stage-3 issues which are better handled via offline, e.g. signaling details, parameter values/ranges, NOT functionality discussion
* For these issues, the discussion rapporteur submits a report with proposals to the next meeting, and input via company Tdocs should be avoided
* Identify the remaining open issues that need to be solved for WI completion in the next meeting
* Company Tdocs for the next meeting should focus on these issues
 |

This contribution intends to propose solutions for the remaining spec issues from the rapporteur’s point of view, without functionality discussion.

In the following sections, we are going to discuss on the non-functional issues listed in the editor’s NOTE that are related to signalling, bit fields, etc. Companies are invited to comment on the proposed WF from the MAC rapporteur.

# 2 Discussions on MAC open issues for SL positioning

## 5.8 Transmission and reception without dynamic scheduling

Editor's NOTE: Whether the above formula for determining the CG occasion for CG type 1 for SL-SCH can be reused for SL-PRS

***ProposedWF*: Revisit the issue when the list of RRC configurations are fully determined**

The rapporteur would like to ask the following question

***Question: Do companies agree with the proposed way-forward for the formula determining CG occasions?***

|  |  |  |
| --- | --- | --- |
| Companies  | Yes/No | Comment |
| **ZTE** | **Yes** |  |
| **Xiaomi**  | **Yes**  |  |
| **Samsung** | **Yes** |  |
| **LG** | **Yes** |  |
| **Intel** | **Yes** |  |

Based on the replies above, all the companies think the propose WF is OK. We hence propose the following:

***Proposal1*: Revisit the issue when the list of RRC configurations are fully determined**

5.22.1.5 Scheduling Request

Editor's NOTE: FFS SR configuration for the SL-PRS resource request MAC CE and PUCCH resource

***ProposedWF*: There can be zero or one SR configuration for SL-PRS resource request MAC CE**

***ProposedWF*: At most one PUCCH resource for SR is configured for SL-PRS resource request MAC CE.**

The rapporteur would like to ask the following question

***Question: Do companies agree with the proposed way-forward for SR configuration and PUCCH resource?***

|  |  |  |
| --- | --- | --- |
| Companies  | Yes/No | Comment |
| **ZTE** | **Yes** |  |
| **Xiaomi**  | **Yes**  |  |
| **Samsung** | **Yes** |  |
| **LG** | **Yes** |  |
| **Intel** | **Yes** |  |

Based on the replies above, all the companies think the propose WF is OK. We hence propose the following:

***Proposal2*: There can be zero or one SR configuration for SL-PRS resource request MAC CE**

***Proposal3*: At most one PUCCH resource for SR is configured for SL-PRS resource request MAC CE.**

#### 5.22.1.1 SL Grant reception and SCI transmission

Editor's NOTE: FFS the details of number of SL-PRS retransmissions selection based on CBR and L1 priority, including the exact RRC fields, etc

***ProposedWF*: Come back to this issue when the signaling details, i.e, the RRC configurations and L1 parameters are completed**

***Quesiton: Do companies agree with the proposed way-forward for the parameters selected during resource selection?***

|  |  |  |
| --- | --- | --- |
| Companies  | Yes/No | Comment |
| **ZTE** | **Yes** |  |
| **Xiaomi**  | **Yes** |  |
| **Samsung** | **Yes** |  |
| **LG** | **Yes** |  |
| **Intel** | **Yes** |  |

Based on the replies above, the majority of the companies think the propose WF is OK. We hence propose the following:

***Proposed4*: Come back to this issue when the signaling details, i.e, the RRC configurations and L1 parameters are completed**

5.22.1.4.1.3 Allocation of sidelink resources

Editor’s NOTE: FFS the prioritization between PRS and data from SCCH, CSI reporting MAC CE, etc.

***ProposedWF*: SL-PRS’s priority is on the same level as data from SCCH and lower than SCI reporting MAC CE, Sidelink Inter-UE Coordination Request MAC CE and Sidelink Inter-UE Coordination Information MAC CE, Sidelink DRX Command MAC CE and data from SCCH.**

***Quesiton: Do companies agree with the proposed way-forward for the priority of SL-PRS with data from SCCH, CSI reporting MAC CE, etc?***

|  |  |  |
| --- | --- | --- |
| Companies  | Yes/No | Comment |
| **ZTE** | **No** | **should be ‘SL-PRS’s priority is on the same level as data from STCH and lower than SCI reporting MAC CE, Sidelink Inter-UE Coordination Request MAC CE and Sidelink Inter-UE Coordination Information MAC CE, Sidelink DRX Command MAC CE and data from SCCH.’** |
| **Xiaomi** | **Yes** | - data from SCCH;- Sidelink CSI Reporting MAC CE;- Sidelink Inter-UE Coordination Request MAC CE and Sidelink Inter-UE Coordination Information MAC CE;- Sidelink DRX Command MAC CE;- data from any STCH and SL-PRS |
| **Samsung** | **Yes** | **Same view as ZTE** |
| **LG** | **No** | **SL-PRS is expected to transmit/measure when it is required (e.g. upon receiving SLPP Request Information Location message). For SL-TDoA, it shows better positioning performance when all anchor UEs transmit SL-PRS at the same time. For SL-RTT, it shows better positioning performance when a paired UE transmits SL-PRS right after receiving SL-PRS from a paired another UE. If SL-PRS is the same priority with STCH, SL-PRS can be delayed due to LCP procedure. So we support that SL-PRS is prioritized between MAC CE and traffic (STCH), as below:**- data from SCCH;- Sidelink CSI Reporting MAC CE;- Sidelink Inter-UE Coordination Request MAC CE and Sidelink Inter-UE Coordination Information MAC CE;- Sidelink DRX Command MAC CE;- SL-PRS;- data from any STCH. |
| **Intel** | **Yes** | In our understanding, the SL-PRS priority should be based on the QoS requirement of the underlying LCS request. In this sense, we think it is ok to have it treated the same way as other SL data traffic (STCH). If the QoS requirement is high enough, the SL-PRS would naturally be prioritized during LCP. |

Based on the replies above, all the companies think the propose WF is OK. We hence propose the following:

***Proposed5*: SL-PRS’s priority is on the same level as data from STCH and lower than SCI reporting MAC CE, Sidelink Inter-UE Coordination Request MAC CE and Sidelink Inter-UE Coordination Information MAC CE, Sidelink DRX Command MAC CE and data from SCCH.**

#### 5.22.1.xx SL-PRS transmission on SL-PRS dedicated resource pool

Editor's NOTE: FFS when source ID length configured as 12bit, whether it is the MSB or LSB of the source layer-2 ID of the UE.

***ProposedWF*: The source ID in SCI for SL-PRS dedicated resource pool when configured as 12 bit is the 12 LSB of the destination ID of the peer UE.**

***Quesiton: Do companies agree with the proposed way-forward for the source ID when it is configured to be 12 bits?***

|  |  |  |
| --- | --- | --- |
| Companies  | Yes/No | Comment |
| **ZTE** | **Yes** | **In legacy procedure for SL data, LSB is used in SCI MSB is used in MAC. So this is ok** |
| **Xiaomi** | **Yes** |  |
| **Samsung** | **Yes** | **Ok to follow legacy principle** |
| **LG** | **Yes** |  |

Based on the replies above, all the companies think the propose WF is OK. We hence propose the following:

***Proposal6*: The source ID in SCI for SL-PRS dedicated resource pool when configured as 12 bit is the 12 LSB of the destination ID of the peer UE.**

#### 6.1.3.xx SL-PRS resource request MAC CE

Editor's NOTE: FFS LCID/eLCID is used for the MAC CE and the number of bits for destination ID and priority

***ProposedWF*: The number of bits for destination ID is 5 bits, the same as in legacy SL-BSR and the number of bits for priority is 3 bits.**

***ProposedWF*: eLCID is adopted for SL-PRS request MAC CE.**

***Question: Do companies agree with the proposed way-forward for the fields in the MAC CE?***

|  |  |  |
| --- | --- | --- |
| Companies  | Yes/No | Comment |
| **ZTE** | **Yes** |  |
| **Xiaomi** | **Yes** |  |
| **Samsung** | **Yes** |  |
| **LG** | **Yes** |  |
| **Intel** | **Yes** |  |

Based on the replies above, all the companies think the propose WF is OK. We hence propose the following:

***Proposal7*: The number of bits for destination ID is 5 bits, the same as in legacy SL-BSR and the number of bits for priority is 3 bits.**

***Proposal8*: eLCID is adopted for SL-PRS request MAC CE.**

In addition to above, the rapporteur would like to understand whether there are other open issues by the following question:

***Question: Do companies think there are other non-functional open issues for MAC spec for SL positioning?***

|  |  |
| --- | --- |
| Companies  | Comment |
| **InterDigital** | RAN2 can consider reset MAC (and SL specific MAC) and cancelling the triggered SL-PRS resource request, same as the cancelling other legacy triggered MAC CEs.According to the 5.12 MAC Reset section:5.12 MAC ResetIf a reset of the MAC entity is requested by upper layers or the reset of the MAC entity is triggered due to SCG deactivation as defined in clause 5.29, the MAC entity shall:**..**1> cancel, if any, triggered BFR;1> cancel, if any, triggered Sidelink Buffer Status Reporting procedure;1> cancel, if any, triggered SL PRS resource request;……If a Sidelink specific reset of the MAC entity is requested for a PC5-RRC connection by upper layers, the MAC entity shall:1> flush the soft buffers for all Sidelink processes for all TB(s) associated to the PC5-RRC connection;1> consider all Sidelink processes for all TB(s) associated to the PC5-RRC connection as unoccupied;1> cancel, if any, triggered Scheduling Request procedure only associated to the PC5-RRC connection;1> cancel, if any, triggered Sidelink Buffer Status Reporting procedure only associated to the PC5-RRC connection;1> cancel, if any, triggered SL PRS resource request only associated to the PC5-RRC connection;… |
| **LG** | RAN2 agreed that SL-PRS priority with 8 levels and they are mapped from positioning QoS. Therefore, a mapping/translation rule is needed between 7/8-bits accuracy value and 3-bits SL-PRS priority level. |

# 3 Discussion on MAC open issues for LPHAP

There are no non-functional open issues in LPHAP for MAC spec from the rapporteur’s point of view. The rapporteur would like to understand the following question:

***Question: Do companies think there are other non-functional open issues for MAC spec for LPHAP?***

|  |  |
| --- | --- |
| Companies  | Comment |
| **Samsung** | Regarding the following change for UE autonomous TA update in the running CR

|  |
| --- |
| 2> if the UE is configured with SRS with validity area and the upper layer indicates the MAC to update the stored RSRP:3> store the RSRP of the downlink pathloss reference with the current RSRP value of the downlink pathloss reference of the camped cell as in TS 38.331 |

From our understanding, the current MAC/RRC running CR seem to implement only the blue part of the following RAN1 agreement and not to capture the yellow part.

|  |
| --- |
| AgreementWith regards to the reference RS for the RSRP change for TA validation:* Alt1: The downlink pathloss reference for TA validation (stored RSRP) is derived from the cell where UE determines the latest valid TA:
	+ If UE maintains the TA from the last serving cell, the stored RSRP of the downlink pathloss reference is derived from SSBs of the last serving cell.
	+ otherwise when UE determines to autonomously adjust TA when enabled by the network and when cell re-selection occurs, if confirmed by RAN4, the stored RSRP of the downlink pathloss reference is updated with a new value derived from SSBs of the current camping cell.
 |

We understand that the autonomous TA adjustment is performed by PHY layer anyway and how to perform it is out of RAN2 scope. However, since PHY layer is not aware of the NW configuration and the cell reselection event, we think some procedure needs to be captured in MAC or RRC spec. on how upper layer indicates PHY to adjust TA value when the corresponding conditions are met.Also, we are not sure whether RRC layer is the right place to trigger the autonomous TA update since RRC layer can not know if there is ongoing SRS transmission (i.e., *srs-ValidityAreaTimeAlignmentTimer* is running) or not. From our perspective, the overall procedure between layers to support the autonomous TA update procedure can be summarized as below.1. Upon cell reselection within the validity area, RRC can check whether the autonomous TA update is enabled by NW. If it is enabled, RRC can indicate the event to MAC.2. When the cell reselection event is indicated by RRC, MAC can actually trigger the TA update procedure after further check whether there is ongoing SRS transmission or not. If the TA update procedure is triggered, MAC can indicate PHY to perform the TA update and update the stored RSRP. [Rapp] As explained, TA update is out of the scopoe of MAC spec |

# 4 Discussion on MAC open issues for REDCAP positioning

There are no non-functional open issues in REDCAP positioning for MAC spec from the rapporteur’s point of view. The rapporteur would like to understand the following question:

***Question: Do companies think there are other non-functional open issues for MAC spec for REDCAP positioning?***

|  |  |
| --- | --- |
| Companies  | Comment |
|  |  |

# 3 Discussion on MAC open issues for CA positioning

There are no non-functional open issues in CA positioning for MAC spec from the rapporteur’s point of view. The rapporteur would like to understand the following question:

***Question: Do companies think there are other non-functional open issues for MAC spec for CA positioning?***

|  |  |
| --- | --- |
| Companies  | Comment |
|  |  |

# 3 Summary

*WF for non-functional issues in Sidelink Positioning*

***Proposal1*: Revisit the issue when the list of RRC configurations are fully determined**

***Proposal2*: There can be zero or one SR configuration for SL-PRS resource request MAC CE**

***Proposal3*: At most one PUCCH resource for SR is configured for SL-PRS resource request MAC CE.**

***Proposed4*: Come back to this issue when the signaling details, i.e, the RRC configurations and L1 parameters are completed**

***Proposed5*: SL-PRS’s priority is on the same level as data from STCH and lower than SCI reporting MAC CE, Sidelink Inter-UE Coordination Request MAC CE and Sidelink Inter-UE Coordination Information MAC CE, Sidelink DRX Command MAC CE and data from SCCH.**

***Proposal6*: The source ID in SCI for SL-PRS dedicated resource pool when configured as 12 bit is the 12 LSB of the destination ID of the peer UE.**

***Proposal7*: The number of bits for destination ID is 5 bits, the same as in legacy SL-BSR and the number of bits for priority is 3 bits.**

***Proposal8*: eLCID is adopted for SL-PRS request MAC CE.**