3GPP TSG-RAN WG2 109bis-e R2-200xxxx

Electronic Meeting, 20th – 30th April, 2020

Agenda Item: 6.8.2.5

Source: Huawei, HiSilicon

Title: Summary for MAC proposals under 6.8.2.5

Document for: Discussion, Decision

# Introduction

This is the summary for the tdocs submitted for agenda item 6.8.2.5 for the impacts to MAC spec for positioning. The summary mainly focus on the following aspects:

* DRX and positioning SRS
* eLCID and SP Positioning SRS Activation/Deactivation MAC CE
* Miscellaneous Issues

The Tdocs under this summary are as follows:

[R2-2003135](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202004%20-%20RAN2_109bis-e%2C%20Online%5CExtracts%5CR2-2003135%20MAC%20CE.docx) Change LCID to eLCID for SP Positioning SRS Activation/Deactivation MAC CE Ericsson CR Rel-16 38.321 16.0.0 0720 - F NR\_pos-Core

[R2-2003062](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202004%20-%20RAN2_109bis-e%2C%20Online%5CExtracts%5CR2-2003062%20Correction%20to%20SP-SRS%20%28de-%29activation%20MAC%20CE.docx) Correction to SP SRS actication deactivation MAC CE Huawei, HiSilicon draftCR Rel-16 38.321 16.0.0 NR\_pos-Core

[R2-2002618](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202004%20-%20RAN2_109bis-e%2C%20Online%5CExtracts%5CR2-2002618%20Discussion%20on%20the%20impact%20of%20DRX%20on%20SRS%20for%20NR%20positioning.docx) Discussion on the impact of DRX on SRS for NR positioning vivo discussion Rel-16 NR\_pos-Core

[R2-2003768](file:///C%3A%5CUsers%5Cmtk16923%5CDocuments%5C3GPP%20Meetings%5C202004%20-%20RAN2_109bis-e%2C%20Online%5CExtracts%5CR2-2003768%20Runnnig%20CR%20to%20MAC%20spec%20for%20R16%20Positioning.docx) Running CR to MAC spec for R16 Positioning Huawei, HiSilicon draftCR Rel-16 38.321 16.0.0 NR\_pos-Core

# Discussions

## eLCID and SP Positioning SRS activation/deactivation MAC CE

In RAN2#109-e, the following agreements have been made on eLCID in the MAC spec

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| Agreements [AT109e][012][R16]* LCID spaces for both DL and UL MAC CEs are extended from Rel-16.
* To extend LCID spaces for MAC CEs, a new MAC subheader with one-byte eLCID field is introduced. Tentatively LCID value 34 is used for both DL and UL for the new MAC subheader.
* When the new MAC subheader with one-byte eLCID field is used, eLCID values 0 to 255 indicates LCID values 64 to 319, accordingly.
* The LCID range in IAB running CR (i.e. 64 to (216 – 65)) is updated to '320 to (216 + 319). It is FFS whether to keep reserved LCID values in IAB running CR.
* For the selection of set1 (below 64) or set2 (above 64), the general principle is that less frequent and low priority MAC CEs should be assigned to set2, and more frequent and high priority MAC CEs (which also requires low overhead) can be assigned to set1 based on consensus. With this principle, the final decision is made by each WI discussion.
* No restriction (e.g. always to have L field) is needed to assign MAC CE to set2.
 |

RAN2 has introduced the eLCID table to address the problem of depletion of LCID values. To determine whether a MAC CE should be assigned an LCID or eLCID value, RAN2 has agreed the general principle that less frequent and low priority MAC CEs should be assigned an eLCID value, and more frequent and high priority MAC CEs (which also requires low overhead) can be assigned an LCID value.

As discused by Huawei and Ericsson, both companies think while the SP Positioning SRS Activation/deactiation MAC CE is desgined only for positioning, the possible application scenarios for this MAC CE may not be quite wide. Hence, both companies propose to categorize it as a set2 MAC CE, with LCID range beyond 64

***Question1: Does company think the LCID/eLCID of SP Positioning SRS Activation/deactiation MAC CE should be above 64?***

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Ericsson | Yes |  |

## DRX and positioning SRS

In the current MAC spec, the relationship between DRX and SRS (aperiodic, semi-persistent, periodic) is captured as follows:

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| --- |
| *TS38.321-v16.0.0*5.7 Discontinuous Reception (DRX)< irrelevant  parts are omitted >When DRX is configured, the MAC entity shall:< irrelevant  parts are omitted >1> in current symbol n, if the MAC entity would not be in Active Time considering grants/assignments/DRX Command MAC CE/Long DRX Command MAC CE received and Scheduling Request sent until 4 ms prior to symbol n when evaluating all DRX Active Time conditions as specified in this clause:2> not transmit periodic SRS and semi-persistent SRS defined in TS 38.214 [7];2> not report CSI on PUCCH and semi-persistent CSI configured on PUSCH.1> if CSI masking (*csi-Mask*) is setup by upper layers:2> in current symbol n, if *drx-onDurationTimer* would not be running considering grants/assignments/DRX Command MAC CE/Long DRX Command MAC CE received until 4 ms prior to symbol n when evaluating all DRX Active Time conditions as specified in this clause:3> not report CSI on PUCCH.NOTE: If a UE multiplexes a CSI configured on PUCCH with other overlapping UCI(s) according to the procedure specified in TS 38.213 [6] subclause 9.2.5 and this CSI multiplexed with other UCI(s) would be reported on a PUCCH resource outside DRX Active Time, it is up to UE implementation whether to report this CSI multiplexed with other UCI(s).Regardless of whether the MAC entity is monitoring PDCCH or not, the MAC entity transmits HARQ feedback, aperiodic CSI on PUSCH, and aperiodic SRS defined in TS 38.214 [7] when such is expected.< irrelevant  parts are omitted > |

Based on the above text, we can make the following two observations:

* Periodic SRS and semi-persistent SRS is not transmitted during DRX inactive time
* Aperiodic SRS is transmitted regardless of the active/inactive time for DRX

While proposed by vivo in R2-2002618, it is proposed that RAN2 should clarify whether transmitting SRS for positioning is allowed when the UE is not in Active Time.

First, we should consider for SP positioning SRS and Periodic SRS and discuss whether they should be transmitted when the MAC entity is not in Active Time. In [R2-2002618], it was proposed to follow the behavior of SRS-Resource transmission, periodic or semi-persistent SRS for positioning is not transmitted when the UE is not in Active Time.

***Question2: Does company think that SP and Periodic Positioning SRS should be transmitted during MAC entity not in Active time?***

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Ericsson | No | It is good to have same as legacy behaviour.  |

Second, for aperiodic positioning SRS, in RAN2#109bis-e, the following agreement has been made:

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| * Send an LS to RAN3, indicating that the RAN2 signalling can currently configure aperiodic SRS for positioning, but we need to know if it the specification effort is feasible to complete from RAN3 perspective. Intel think this could be done in a reply to the previous RAN1 LS. (R2-1914310)
 |

Hence, currently, the status of support for aperiodic positioning SRS is still pending to the decision in RAN3. If aperiodic positioning SRS is supported, we need to discuss whether it can be transmitted during inactive time.

***Question3: Does company think that Aperiodic Positioning SRS should be transmitted during MAC entity not in Active time, if aperiodic positioning SRS is supported?***

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Ericsson | Yes | It is good to have same as legacy behaviour.  |

## Misc Issues

In the current MAC spec, the description for the field within the MAC CE is captured as follows:

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| - DL-PRS ID: This field contains an identity for DL-PRS resource *dl-PRS-ID* as defined in TS 37.355 [23]. The length of the field is 8 bits; |

While, Huawei thinks this is not correct since this DL-PRS ID is defined by RAN1 to uniquely identify the PRS resource within a TRP. Hence it is more of an identity associated with a TRP. In [R2-2003768], the following change is proposed.

|  |
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| - DL-PRS ID: This field contains an identity accociated with a certain TRP, which is the field *dl-PRS-ID* as defined in TS 37.355 [23]. The length of the field is 8 bits; |

***Question4: Do company agree with the above change?***

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Ericsson |  | This is related to other discussion that we have also in LPP. We can discuss this as well as part of that or it will be covered. |

There are also some editorial changes within [R2-2003768]

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| - C: This field indicates whether the octets containing Resource Serving Cell ID field(s) and Resource BWP ID field(s) withn the field Spatial Relation for Resource ID i are present, except for Spatial Relation Resource IDi with DL-PRS or SSB. When A/D is set to 1, if this field is set to 1, the octets containing Resource Serving Cell ID field(s) and Resource BWP ID field(s) in the field Spatial Relation for Resource IDi are present, otherwise if this field is set to 0, they are not present. When A/D is set to 0, this field is always set to 0 that they are not present;===omitted==- DL-PRS Resource ID: This field contains an index for DL-PRS resource *nr-DL-PRS-ResourceId* as defined in TS 37.355 [23]. The length of the field is 6 bits; |

**Question5: *Do company agree with the above editorial change?***

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| --- | --- | --- |
| Company | Yes/No | Comments |
| Ericsson | Yes | Looks ok. |

## Others

**Question6: *Any other comments related to MAC Running CR?***

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| --- | --- | --- |
| Company | Fields | Comments |
| Ericsson | SUL | SUL for positioning has not been discussed. It is good to omit it for now. Otherwise some signaling would be needed to indicate in NRPPa where SUL or NUL has been used? |
| Spatial Relation Optionality | Spatial Relation should be optional or not needed for example for FR1. When MAC CE is provided, there should be explicit indication whether spatial relation is present or absent. |
| BWP | UE may support multiple BWP; should NW send spatial relation per BWP? Same relation can be applicable for all BWP. Thus no need to repeat spatial relation for every BWP. An indication can be used if spatial relation is applicable for all BWP. |
| DL PRS Resource ID | DL PRS Resource ID is optional for spatial relation as UE can identify based upon TRP ID and Resource set. This Optionality should be indicated in MAC CE design. |

# Conclusion

Based on the above summary, we make the following proposals that we think can be discussed during the online session in RAN2#109bis-e:

***Proposal1:***