3GPP TSG-RAN WG2 #114-e electronic R2-210xxxx

Electronic Meeting, 19th – 27th May, 2021

Agenda Item: 8.17.1

Source: Intel Corporation

Title: [AT114-e][035][feMIMO] TCI states indication for PDCCH (Intel)

Document for: Discussion, Decision

# 1 Introduction

This contribution summarizes the following discussion:

* [AT114-e][035][feMIMO] TCI states indication for PDCCH (Intel)

      Scope: Treat R2-2104712 and the related submitted tdocs.

      Discuss the topic, attempt to make some basic agreements, e.g. agree to have the requested MAC CE, and potentially identify FFS.

      Intended outcome: Report

      Deadline: Monday May 24 for on-line CB

Contact person(s) for each participating company:

|  |  |  |
| --- | --- | --- |
| Company | Name | Email Address |
| Intel  | Youn Heo | Youn.hyoung.heo@intel.com |
|  |  |  |
|  |  |  |

# 2 Discussion

RAN1 sent an LS [1] to inform RAN1 agreement on PDCCH enhancement. In this LS, RAN1 agreed to introduce enhanced MAC CE signaling for PDCCH activating two TCI states for SFN-based PDCCH transmission.

|  |
| --- |
| **Agreement*** Introduce enhanced MAC CE signaling for PDCCH activating two TCI states for SFN-based PDCCH transmission
	+ The corresponding MAC CE includes at least the following fields
		- Serving cell ID
		- CORESET ID
		- Two TCI state IDs
	+ FFS whether for CA scenario additionally support RRC configured set of the serving cells which can be addressed by a single MAC CE
	+ FFS whether or not enhanced MAC CE signaling is applicable to a CORESET configured with CORESETPoolindex
 |

All contributions [2-5] seem to agree that the existing TCI State Indication for UE-specific PDCCH MAC CE is not enough.

**Q1: Do you agree that the exsiting MAC CE is not sufficient to support Rel-17 PDCCH enhancement and therefore we should introduce enhanced MAC CE?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Intel | Yes |  |

RAN1 requested to include the following fields 1) serving cell ID, 2) CORESET ID, 3) Two TCI state IDs.

**Q2: Do you agree that the enhanced MAC CE should include the following fields 1) serving cell ID, 2) CORESET ID and 3) Two TCI state IDs?**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Intel | Yes |  |

Three companies provide the possible enhanced MAC CE structure. Two of them ([2,4]) are the same format, while the other [5] is slightly different. However, there seems no big difference. Is there any preference between two formats?

**Q3: Which MAC CE strcture is preferred?**

 

Option 1 [2,4] Option 2 [5]

|  |  |  |
| --- | --- | --- |
| Company | Preference  | Comments |
| Intel | Either one is ok.  |  |

There are some views that RAN2 should ask RAN1 on some questions to clarify [4,5].

1. Whether the enhanced TCI state indication for UE specific PDCCH MAC CE can be applied to a set of serving cells configured in simultaneousTCI-UpdateList1 or simultaneousTCI-UpdateList2? [4]
2. Which CORESET can be indicated with two TCI states ? [5]
3. How many TCI states (i.e. maximum number) can be configured for the CORESET indicated with two TCI states? [5]
4. Anything else?

**Q4: Do you agree to send LS to aks RAN1 some questions? If yes, are the above question A-C reasonable to ask? Companies are also invited to provide more questions if deemed useful.**

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments  |
| Intel | No | Question A: This issue is currently captured as FFS bullet in RAN1 LS [1]. Question B: we understand that it should not be applicable to CORESET 0 similar to Rel-15 MAC CE design.Question C: There is no proposal in RAN1 to increase the number of TCI states to larger value comparing to Rel-15.  |

**Q5: Is there any aspect that RAN2 needs to discuss?**

|  |  |
| --- | --- |
| Company | Comments  |
|  |  |

# 3 Conclusion

To be updated.

# 4 References

1. R2-2104712 LS on TCI states indication for PDCCH (R1-2104064; contact: Intel) RAN1 LS in Rel-17 NR\_feMIMO-Core To:RAN2
2. R2-2105027 Enhanced MAC CE for PDCCH in multi-TRP deployment Intel Corporation discussion Rel-17 NR\_feMIMO
3. R2-2105907 On the LS about Activating two TCI states with a MAC CE Ericsson discussion NR\_feMIMO-Core
4. R2-2105858 Consideration on the enhanced TCI state indication MAC CE for PDCCH ZTE, Sanechips discussion Rel-17 NR\_feMIMO-Core
5. R2-2105731 Enhanced TCI State Indication for UE-specific PDCCH MAC CE Xiaomi Communications discussion Rel-17 NR\_feMIMO-Core