**‎3GPP TSG-RAN WG2 Meeting #111 electronicR2-20xxxxx**

**Online, August 17th - 28th, 2020‎**

**Agenda item: 6.4.2**

**Source: CATT**

**Title: ‎Discussion paper on [Post111-e][701][V2X] 38.304 and 36.304 corrections‎**

**Document for: Discussion and Agreement**

# 1 Introduction

This is to report the result of the following email discussion after RAN2#111-e Meeting [1].

* [POST111-e][701][V2X] 38.304 corrections (CATT for discussion and 38.304 CR, Vivo for 36.304 CR)

Discuss the need of changes proposed from R2-2006620 and R2-2007877, detailed wordings if CR is required, and prepare agreeable 38.304 CR in R2-2008356 and 36.304 CR in R2-2008357. Note cover-page should be well written (with reasonable impact analysis). CRs will be approved by email. Deadline is 9/3 10:00am (UTC).

The remainder of this document is organized to discuss the corrections from {R2-2006620 and R2-2007877} ‎as the following. The discussions are in Section 2 and the conclusions are summarized in Section 3.

# 2 Discussion

## 2.1 NR sidelink reception

The related proposal is available in the below table:

|  |  |  |
| --- | --- | --- |
| Company | Tdoc | Proposals |
| CATT | R2-2006620‎ | “The UE shall not perform NR sidelink ~~communication~~transmission according to SL-V2X-PreconfigurationNR if the UE detects a cell providing NR sidelink configuration or inter-carrier NR sidelink configuration for the frequency the UE is interested to perform NR sidelink communication on.” |

Consideration on the case that UE performs both NR and V2X sidelink ‎reception under the cell only providing NR sidelink configuration or V2X ‎sidelink configuration, there is no interference problem. E.g. if the UE ‎camps on a cell only providing V2X sidelink configuration and detects ‎another cell only providing NR sidelink configuration, the UE can ‎perform NR sidelink reception using pre-configuration. The UE is ‎unnecessary to reselect to the cell providing NR sidelink configuration to ‎perform NR sidelink reception. From the point of view of simplifying the ‎reception UE behaviour, the UE should be able to perform NR sidelink ‎reception according to SL-V2X-PreconfigurationNR even if the UE ‎detects a cell providing NR sidelink configuration or inter-carrier NR ‎sidelink configuration for the frequency that UE is interested to perform NR ‎sidelink communication on.‎ Thus, the CR in R2-2006620‎ proposed to change “NR sidelink communication” into “NR sidelink transmission” to simplify the ‎reception UE behaviour. Companies are encouraged to provide inputs on the following questions.

**Question1: Does company agree the 1st change in R2-2006620‎, i.e., change ‎“NR sidelink communication” into “NR sidelink transmission” in 38.304 as proposed in the above table?**

|  |  |  |
| --- | --- | --- |
| Company Name | Views:  Agree/Disagree | Comments |
| Samsung | Disagree | We prefer to keep previous agreement not to use pre-configuration if the UE is in-coverage. RX operation has no problem without this enhancement. |
| Huawei | Disagree | Agree with Samsung. Also, with this unnecessary change, there can be cross-Spec misalignment between TS 38.304 and TS 38.331. |
| Ericsson | Disagree | We do not see strong need for this change. Current specification works fine. |
| MediaTek | No strong view | We are not sure that anything is broken in the current spec, but it’s also correct that Rx operation based on preconfiguration does not cause an interference problem and there does not seem a strong motivation to forbid it in this case. We can accept majority view. |
| OPPO | Disagree | The intention of this sentence is to say that UE should follow SIB/dedicated-RRC while the UE is in-coverage (in either intra-frequency or inter-frequency manner), while the proposed change would like to pick-up an exceptional case where the UE for some reason (e.g., due to the on-going PC5/Uu traffic in another cell) fails to camp on the detected cell providing the NR sidelink configuration and can use pre-configuration for reception. It is an over-correction, and would lead to misunderstanding that even if the UE is in-coverage, pre-configuration can be used for reception.  And even for the exceptional case, to allow reception only does not bring obvious benefit, so it is preferred to keep the legacy text for both 36/38-spec. |
| LG | Disagree |  |
| CATT | Agree(proponent)‎ | We think this case isn’t a corner case due to UE supporting both NR and LTE SL. And this change has some benefit for reception procedure, so that the UE can at least receive message from other RAT. |
| Nokia | Disagree | We prefer not to change the formulation in the agreement. |
| Apple | Disagree | While we have the sympathy on the intention, the change is wrong. If UE detects a cell which provides NR SL config, then UE cannot use pre-configuration for SL reception, either. The working assumption is that the UE needs to follow NW configuration and the NW configuration takes care of the coordinated RX POOL(s) configures in case this UE need to receive NR SL data transmitted by OOC UE. Also, it is possible that the SL-preconfiguration does not cover the geographic areas where UE can detect a NR SL-capable cell. |
| Qualcomm | Disagree | Agree this seems an unnecessary change |
| vivo | Disagree |  |
| ZTE | Disagree | We fail to see any problem for UE’s reception by using pre-configuration. |

If the reason of 1st change in Q1 is an issue, Rapporteur ‎thinks we can further discuss whether it is necessary to make the similar change in 36.304, as below:

*The UE shall not perform V2X sidelink ~~communication~~transmission according to SL-V2X-Preconfiguration if the UE detects a cell providing V2X sidelink configuration or inter-carrier V2X sidelink configuration for the frequency UE is interested to perform V2X sidelink communication on.*

**Question2: Does company agree to make the change as above in 36.304?**

|  |  |  |
| --- | --- | --- |
| Company Name | Views:  Agree/Disagree | Comments |
| Samsung | Disagree | Same as Q1. We prefer to keep previous agreement. |
| Huawei | Disagree | On top of our comments to Q1, we cannot understand why people want to change legacy LTE SL V2X specification, when we are actually working on a different WI for NR SL (especially in case of no essential issue) |
| Ericsson | Disagree | We do not see strong need for this change. Current specification works fine. |
| MediaTek | No strong view | Same as Q1. We can accept majority view. |
| OPPO | Disagree |  |
| LG | Disagree |  |
| CATT | Agree | Same as Q1. But we can accept majority view for 36 spec. |
| Nokia | Disagree | Same as Q1 |
| Qualcomm | Disagree | Same as Q1 |
| vivo | Disagree |  |
| ZTE | Disagree |  |

**Proposed conclusion:**

Since almost all companies don’t agree this changes, Rapporteur ‎thinks it can be concluded not pursue this change on NR sidelink reception.

## 2.2 RRC\_INACTIVE state

The related proposal is available in the below table:

|  |  |  |
| --- | --- | --- |
| Company | Tdoc | Proposals |
| CATT | R2-2006620‎ | ‎Add RRC\_INACTIVE state in cell selection and reselection for sidelink ‎operation in 38.304.  The requirements defined in this clause for sidelink operation apply for UEs in RRC\_IDLE, RRC\_INACTIVE and in RRC\_CONNECTED. |
| vivo | R2-2007877‎ | Add RRC\_INACTIVE state in cell selection and reselection for sidelink ‎operation in 36.304.  The requirements defined in this clause for sidelink operation apply for UEs in RRC\_IDLE, RRC\_INACTIVE and in RRC\_CONNECTED. |

RAN2 agreed to support a sidelink UE in all RRC states/coverage scenarios ‎‎(i.e. RRC\_CONNECTED, RRC\_INACTIVE/RRC\_IDLE, and OOC). However, ‎description of RRC\_INACTIVE is missing in cell (re)selection requirements ‎defined for sidelink operation. ‎Thus, the CR in R2-2006620‎ proposed to add RRC\_INACTIVE state in cell selection and reselection for ‎sidelink ‎operation in 38.304. The CR in R2-2006620‎ proposed to add RRC\_INACTIVE state also in 36.304. Companies are encouraged to provide inputs on the following question.

**Question3: Which option does company agree for RRC\_INACTIVE state in cell selection and reselection in sidelink ‎operation?‎**

**‎-‎ Option 1: Only add RRC\_INACTIVE state in ‎‎38.304‎, Clause 8.2;**

**‎-‎ Option 2: Only add RRC\_INACTIVE state in ‎‎36.304, Clause 11.4‎;**

**-‎ Option 3: Add RRC\_INACTIVE state in both 38.304, Clause 8.2 and 36.304, Clause 11.4;**

**- Option 4: Disagree to add RRC\_INACTIVE state in both 38.304 and 36.304.**

|  |  |  |
| --- | --- | --- |
| Company Name | Views:  Option1/2/3/4 | Comments |
| Samsung | Option 3 |  |
| Huawei | No strong view | Note that if RAN2 agrees the change to 36.304 as well and agrees the change of legacy Spec, the change should be applied from Rel-15 Spec. To us, however, it seems not to be a fatal problem, even if we start from Rel-16. |
| Ericsson | Option 3 | In this case we need to add the RRC\_INACTIVE since it has been forgotten to do so during the WI phase. The specs should be clear on what is supported. |
| MediaTek | Option 3 | This seems just to be an oversight in the spec. |
| OPPO | 1 | Agree it is missing for 38-Spec.  For 36-Spec, RRC\_INACTIVE is not included in section 36.331 5.10.1a, so no need to include that. |
| LG | 1 | Agree with OPPO. |
| CATT | Option 1 | Share the same view as OPPO. |
| Nokia | Option 1 |  |
| Apple | Option 3 |  |
| Qualcomm | Option 3 |  |
| vivo | Option 3 | RAN2 agreed to support a sidelink UE in all RRC states/coverage scenarios (i.e. RRC\_CONNECTED, RRC\_INACTIVE/RRC\_IDLE, and OOC). This applies to both NR and eLTE control SL specifications. |
| ZTE | Option 1 |  |

**Proposed conclusion:**

Option 1: 5

Option 2: 0

Option 3: 6

Option 4: 0

No strong view: 1

Based on companies’ inputs, all the companies agree to add RRC\_INACTIVE state in ‎‎38.304‎. For 36.304, 6 companies agree to add RRC\_INACTIVE state‎, while 5 companies disagree and one company has no strong view. Rapporteur ‎thinks it can be concluded at least to add RRC\_INACTIVE state in ‎‎38.304‎, Clause 8.2‎. For 36.304, we can postpone to the next meeting.

**Conclusion: RAN2 agree to add RRC\_INACTIVE state in ‎‎38.304‎, Clause 8.2‎.‎ FFS whether to add RRC\_INACTIVE state in ‎‎36.304.**

## 2.3 Cell selection and reselection

The related proposal is available in the below table:

|  |  |  |
| --- | --- | --- |
| Company | Tdoc | Proposals |
| CATT | R2-2006620‎ | ‎When UE is interested to perform NR sidelink communication on non-serving frequency, it may perform measurements on that frequency or the frequencies which can provide inter carrier NR sidelink configuration for that frequency for cell selection and reselection purpose in accordance with TS 38.133[8]. When UE is interested to perform V2X sidelink communication on non-serving frequency, it may perform measurements on that frequency or the frequencies which can provide inter carrier V2X sidelink configuration for that frequency for cell selection and reselection purpose in accordance with TS 38.133[8]. |

Consideration on the case that UE performs both NR and V2X sidelink ‎communication under the cell only providing NR sidelink configuration or ‎V2X sidelink configuration, it can’t restrict UE to only perform intra-‎frequency cell reselection when UE is interested to perform NR sidelink ‎communication or V2X sidelink communication on non-serving ‎frequency. The UE shall perform inter-frequency or inter-RAT cell ‎reselection in this case.‎ Thus, the CR in R2-2006620‎ proposed to remove intra-frequency restriction for cell reselection when UE is ‎interested to perform NR sidelink ‎communication or V2X sidelink ‎communication on non-serving frequency.‎ Companies are encouraged to provide inputs on the following questions.

**Question4: Does company agree to remove intra-frequency restriction for cell reselection when UE is ‎interested to perform NR sidelink ‎communication ‎or V2X sidelink ‎communication on non-serving frequency‎ in 38.304?**

|  |  |  |
| --- | --- | --- |
| Company Name | Views:  Agree/Disagree | Comments |
| Samsung | Agree |  |
| Huawei | Disagree | We fail to see a critical problem in the current description. Maybe there is misreading of the current Spec: it says (at least in literal), for the intra-frequency cell reselection purpose, the UE may perform measurement *on “that frequency”*, or perform measurement *on “the frequencies”* which can provide inter carrier NR sidelink configuration for that frequency*”*, rather than only the *former* case (i.e. on “that frequency”) being allowed. Isn’t this already enough; what other frequencies does the UE have to measure as well? Also, this part of the Spec only says the UE “may” perform such measurement, and whether the UE “really” performs is finally up to its implementation. From a protocol point of view, does an extension as proposed above really make much sense in such a case? |
| Ericsson | Agree |  |
| MediaTek | Agree | We don’t fully understand Huawei’s comment. In our reading, the meaning of the current text is as follows:   * Suppose the UE camps on F1, is interested in NR sidelink communication on F2 (“that frequency” in the spec), and can obtain an inter-carrier configuration from F3 and F4 (“the frequencies which can provide inter carrier NR sidelink configuration for that frequency” in the spec). * The spec says the UE can perform measurements on F2/F3/F4… * …but only “for cell selection and intra-frequency reselection purpose”. * Thus, the UE might measure e.g. F3 and find it good enough to reselect to, but it would currently be guided not to reselect to it since this is not an intra-frequency reselection.   We don’t understand that the CR says the UE would measure any additional frequencies; it only says that when the UE does measure the concerned frequencies, the measurements may be used in support of inter-frequency as well as intra-frequency reselection. |
| OPPO |  | We agree the current spec is not clear enough, the original intention of the text is that the measurement is not only for the inter-frequency reselection from the current frequency to the target frequency, but also for the subsequent intra-frequency reselection on the target frequency.  So we tend to keep the text for 36-CR,  Yet improve the text for readability in 38-CR, but different from the proposed change, to change “for cell selection and intra-frequency reselection” to “for inter-frequency reselection”. i.e., Not sure why it is related to cell selection? |
| LG | Agree |  |
| CATT | Agree(proponent)‎ | We also don’t understand Huawei’s comments. We share the same view as MediaTek that the change is not related to the measurement. The change is to clarify UE may perform intra-frequency reselection or inter-frequency reselection by using the measurement. Thus, we think the correction is necessary.  Regarding to the comments from OPPO, we think the current spec is to say when UE perform cell selection and intra-frequency reselection to that interesting frequency, the UE may use the measure results for that interesting frequency or the frequencies which can provide inter carrier NR sidelink configuration for that interesting frequency. Thus we prefer to keep cell selection and intra-frequency reselection cases in the spec. |
| Nokia | Agree | Same view as MediaTek. We also agre with Oppo that the current formulation of the spec is ambiguous and not clear, so a better formulation might help to eliminate misunderstanding. |
| Apple | Agree | Same view as MediaTek |
| Qualcomm | Agree | Agree with MediaTek |
| ZTE | Agree |  |

If the reason of Q4 is an issue, Rapporteur ‎thinks we can further discuss whether it is necessary to make the similar change in 36.304, as below:

*When UE is interested to perform sidelink communication or sidelink discovery announcement on non-serving frequency, it shall perform measurements on that frequency for cell selection and intra-frequency reselection purpose in accordance with TS 36.133 [10]. When UE is interested to perform V2X sidelink communication on non-serving frequency, it may perform measurements on that frequency or the frequencies which can provide inter-carrier V2X sidelink configuration for that frequency for cell selection and reselection purpose in accordance with TS 36.133 [10]. When UE is interested to perform NR sidelink communication on non-serving frequency, it may perform measurements on that frequency or the frequencies which can provide inter-carrier NR sidelink configuration for that frequency for cell selection and reselection purpose in accordance with TS 36.133[10].*

**Question5: Does company agree to remove intra-frequency restriction for cell reselection as above in 36.304?**

|  |  |  |
| --- | --- | --- |
| Company Name | Views:  Agree/Disagree | Comments |
| Samsung | Agree |  |
| Huawei | Disagree | Same as our comments to Q4. |
| Ericsson | Agree |  |
| MediaTek | Agree |  |
| OPPO | Disagree | As replied to Q4 |
| LG | Agree |  |
| CATT | Agree | We think this correction is an R16 CR for 36.304, which will not impact legacy R14/R15 UE. Thus, since the spec is unclear, we think it would be better to correct it at least starting from R16. |
| Nokia | Agree |  |
| Apple | Agree |  |
| Qualcomm | Agree |  |
| ZTE | Agree |  |

**Proposed conclusion:**

11 companies shared their views‎. 9 companies agree to remove intra-frequency restriction for cell reselection in both 38.304 and 36.304, while 2 companies disagree this change and would like to have more time to check. Rapporteur ‎thinks there are two following options to be decided which way we can go during this email discussion.

* Option 1: Based on the majority view, RAN2 agree to remove intra-frequency restriction for cell reselection in both 38.304 and 36.304 to include inter-frequency cell reselection case. For other issues, e.g., whether to delete cell selection case, can be further discussed in the next meeting.
* Option 2: Keep the current 38.304 and 36.304 specs and postpone this issue to the next meeting.

Thus, companies are encouraged to share your views on the above two options during Ph2 discussion.

**Question6: Which following option does company agree for the intra-frequency restriction on cell reselection?**

* **Option 1: Based on the majority view, RAN2 agree to remove intra-frequency restriction for cell reselection in both 38.304 and 36.304 to include inter-frequency cell reselection case. For other issues, e.g., whether to delete cell selection case, can be further discussed in the next ‎meeting.‎**
* **Option 2: Keep the current 38.304 and 36.304 specs and postpone this issue to the next meeting.**

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| --- | --- | --- |
| Company Name | Views:  Option 1/2 | Comments |
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# 3 Conclusion

TBD

# 4 References

[1] RAN2-111-e\_V2X\_Kyeongin\_2020-08-28\_EOM