3GPP TSG RAN WG1 #108-e R1-220xxxx

e-Meeting, February 21st - March 3rd, 2022

**Source: Moderator (Nokia)**

**Title:** **Summary of [108-e-R16-V2X-07] Corrections on SL timing (R1-2202357)**

**Agenda item: 7.2.4**

**Document for: Discussion and Decision**

# Introduction

The document is to collect companies’ views and provide a summary for the email discussion thread:

[108-e-R16-V2X-07] Corrections on SL timing; considering R1-2202357.

# Discussion

## Editorial changes

In R1-2202357 it is proposed to add to the clause 2 of 38.211 the following references:

[12] 3GPP TS 38.133: "NR; Requirements for support of radio resource management”

[13] 3GPP TS 38.304: “NR; User Equipment (UE) procedures in Idle mode and RRC Inactive state”

Also, it is proposed the add serial numbers to the references in the text i.e.

[12, TS 38.133] and [13, TS 38.304]

**Question 1: Do you agree that the changes should be adopted? If no, please provide the reasons and suggestions, if any.**

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| **Company** | **Views** |
| Intel | Agree, subject to resolution of Q2 and Q3 which use these references. |
| Qualcomm | Yes |
| Samsung | Agree with the changes. |
| OPPO | Agree |
| LG Electronics | See our comments in Q 2/3 (i.e., no changes are preferred). |
| Sharp | Agree |
| Ericsson | OK |
| ZTE, Sanechips | Agree |
| CATT, GOHIGH | Agree |
| Huawei, HiSilicon | Agree. |

## Timing offset in the serving cell

The draft CR proposes the following changes:

In a serving cell fulfilling the S criterion according to clause 8.2 of [13, TS 38.304]

- The timing of reference radio frame equals that of downlink radio frame in the cell with the same uplink carrier frequency as the sidelink and

- is given by clause 7.1.2 of [12, TS 38.133] ,

The first change (In a serving cell fulfilling the S criterion …) is intended to clarify that the *NTA,offset* value specified for UL transmissions is only applicable in the case when SL transmission takes place in the UL carrier. If UE has a serving cell fulfilling S criterion but SL transmissions take place in the dedicated SL carrier, then *NTA,offset* = 0 as specified in “Otherwise” section.

The second change proposes to refer to UL timing clause of 38.133 instead of 38.211 to obtain *NTA,offset* values. (In LTE, 36.211 included *NTA,offset* values but in NR specifications values are given in 38.133).

**Question 2: Do you agree that the changes should be adopted? If no, please provide the reasons and suggestions, if any.**

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| **Company** | **Views** |
| Intel | Agree. In our understanding, there are cases when a UE has a serving cell, but uses ITS spectrum, which are not covered by current spec version. |
| Qualcomm | We agree with the first change “In a serving cell fulfilling the S criterion according to clause 8.2 of [13, TS 38.304]”  We don’t think the second change is necessary. Existing specification was clear in that it referred to 38.211 🡪 38.213 (where the RRC parameter was noted) 🡪 38.133 (when RRC parameter is not configured). With the change, the reference becomes 38.133 then based on the note in the table (when RRC parameter is configured) 🡪 38.213 (where the RRC parameter was noted). |
| Samsung | First change is not strictly needed. It should be clear when we say “If the UE has a serving cell …” the description applies to the serving cell.  The second change is fine. |
| OPPO | Generally we agree with the intention of the change in the main bullet. The case of SL in dedicated carrier (should belong to otherwise branch. While the wording “in a serving cell” may be also confusing. We suggest the wording below which follows the same description method as in 12.3.1.1 in 38.133.  “If the UE is in-coverage with a serving cell on a NR sidelink carrier ”  For the change in the second sub-bullet, we agree with QC that it is not necessary. |
| LG Electronics | **1st change**:  Our understanding is that the current specification supports a case where the reference timing of SL Tx/Rx in ITS dedicated carrier is the timing of UE’s serving cell fulfilling S criterion in Licensed carrier. For this case, applying NTA,offset value of UL Tx in Licensed carrier to SL Tx/Rx in ITS dedicated carrier could be reasonable in terms of ensuring the frame (or slot) boundary alignment between UL Tx and SL Tx from the point of view of a single UE. By dosing, the serving cell can efficiently control/decide the overlap between UL Tx and SL Tx for the UE. Note that when UL Tx and SL Tx overlap in time, the transmit power of the UE is split between them. So, we have a concern on the intention of 1st change, and prefer not to do it  **2nd change**:  We tend to agree with Qualcomm’s comment, and 2nd change is not needed. |
| Sharp | Agree with both changes and reasoning from Moderator. |
| NTT DOCOMO | Same view with QC. |
| Ericsson | We agree with the changes |
| vivo | **1st change**:  We don’t think this change is needed. Please note that in the sub bullet the spec says “… in the cell with the same uplink carrier frequency as the sidelink”. Here it clearly refers to ***the cell*** in the mail bullet that the UE has and fulfilling the S criterion. Thus, there should not be any confusion here.  **2nd change**:  We tend to agree with Qualcomm and others that the 2nd change is not needed either. |
| ZTE, Sanechips | Same view as QC, the 2nd change is not necessary. |
| CATT, GOHIGH | For the 1st change, we share similar views as vivo, the 1st sub-bullet has said that this is only for the case when sidelink is the same as UL carrier frequency. Therefore, we think it is not necessary.  For 2nd change, we are ok to directly refer to 38.133. |
| Huawei, HiSilicon | On the first change, the point is how to interpret the wording “if the UE has a serving cell…”. It can be understood as the UE has SL transmission in the UL carrier, then the reference timing is determined as …. However, if it is changed to “In a serving cell… ” , there would be an ambiguous case that “Although the UE camps in a serving cell fulfilling S criterion, its SL transmissions take place in the dedicated SL carrier, then the downlink timing is used”. So we prefer not to have such a change.  On the second change, we share with others that it is not needed. The reference logic in the spec is clear. |

## Timing in the dedicated SL carrier

The draft CR proposes the following changes:

Otherwise

- The timing of reference radio frame *i* and are given by clause 12.2.2, 12.2.3, 12.2.4 or 12.2.5 of [12, TS 38.133]

The implicit obtaining of timing of reference radio frame from 38.213 is ambiguous because clause 4.2 of 38.213 defines UL timing w.r.t DL timing but e.g., in the case of GNSS as the timing reference, it is not clear if clause 4.2 of 38.213 is relevant. In addition, because *NTA,offset* values for UL are not specified in 38.211 but in 38.133 it is proposed that the same practice is applied to SL as well.

**Question 3: Do you agree that the changes should be adopted? If no, please provide the reasons and suggestions, if any.**

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| **Company** | **Views** |
| Intel | Agree. We also suggest to simply refer to parent 12.2 clause which contains all the referred subclauses. |
| Qualcomm | We don’t think the change is necessary. Existing specification text was clear and directly stated that NTA,offset = 0. |
| Samsung | OK with the changes. |
| OPPO | Agree |
| LG Electronics | Since there is no critical problem on interpreting the correction operation even with the current specification, we prefer not to do it. |
| Sharp | Agree with the changes. |
| NTT DOCOMO | Agree |
| Ericsson | OK |
| vivo | We agree with the changes of the references fixing part.  However, we don’t agree with the change of NTA,offset. The current spec is clear regarding NTA,offset = 0. |
| ZTE, Sanechips | Same view as vivo, it is a more straight way to set NTA,offset = 0. |
| CATT, GOHIGH | Similar views as vivo, OK to directly refer to 38.133, and prefer to keep NTA,offset = 0 |
| Huawei, HiSilicon | We do not think the change on reference is very crucial, even without changes, the UE does not implement wrongly. The deleting of NTA,offset is not needed. It would be more straightforward and not misleading to directly define here. |

# Conclusion

# References

1. R1-2202357 Draft CR on corrections on SL timing Nokia, Nokia Shanghai Bell