**3GPP TSG-RAN WG2 #113-e *R2-210xxxx***

**E-meeting, January 2021**

Agenda Item: 6.4.2

Source: OPPO

Title: Summary of  [AT113-e][704][V2X/SL] Left issue on reset configuration (OPPO)

Document for: Discussion, Decision

# Introduction

This is for the following email discussion

* [AT113-e][704][V2X/SL] Left issue on reset configuration (OPPO)

**Scope:** discuss if there is real problem with the current specification and what is the best option to solve it (if problem is justified). Prepare the agreeable CR (if needed).

**Intended outcome:** Agreeable 38.331 CR in R2-2102178 and discussion summary in R2-2102179 (if needed).

**Deadline:** Feb 04 0430 (UTC)

# Discussion

In the current spec, the procedure for reset configuration is specified as follows

5.8.9.1.10 Sidelink reset configuration

The UE shall:

1> release/clear all current sidelink radio configuration of this destination;

1> release the sidelink DRBs of this destination, in according to sub-clause 5.8.9.1a.1;

1> reset the sidelink specific MAC of this destination.

NOTE: Sidelink radio configuration is not just the resource configuration but may include other configurations included in the *RRCReconfigurationSidelink* message except the sidelink DRBs of this destination.

I.e., there are 3 aspects specified, configuration release, bearer release and MAC re-set.

As clarified in [1], the R16 V2X is designed in a way that the configuration / operation is direction-specific, i.e., UE1 is in charge of the configuration for the direction of UE1 => UE2, while UE2 is in charge of the configuration for the direction UE2 => UE1, so there is a need to check if the reset configuration is in line with the design principle.



Figure 1 Configuration flow for PC5 interface   
(gNB1 controls of UE1=>UE2 direction, gNB2 controls UE2=>UE1 direction)

In the following, the questions are to firstly check the intention and then to check whether a CR is needed including whether the wording is correct or not.

## Issue-1: Configuration Release

According to the current spec, the configuration release is specified as follows

1> release/clear all current sidelink radio configuration of this destination;

[…]

NOTE: Sidelink radio configuration is not just the resource configuration but may include other configurations included in the *RRCReconfigurationSidelink* message except the sidelink DRBs of this destination.

In [1], it is proposed that

P1: For reset configuration, only the configuration received in the *RRCReconfigurationSidelink* is released.

**Q1-1: Do you agree that, during the re-set configuration, only the configuration received in the *RRCReconfigurationSidelink* (i.e., the configuration for Rx) is to be released, i.e., the configuration received from dedicated-RRC/SIB/Pre-configuration (i.e., the configuration for Tx) is not released?**

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| --- | --- | --- |
| Company | Agree/Not-agree | Comment |
| Samsung | Agree | We are fine to make clarification as the rapporteur pointed out. |
| Nokia | Agree | PC-RRC for the established PC5 connection Tx->Rx (UE1 to UE2) is released (while UE2 to UE1 PC5 connection is not released) and the spec clearly says “all current sidelink radio configuration of this destination”. So the clarification helps understanding but we think there is no issue. |
| MediaTek | Agree | Same understanding as the rapporteur. |
| Huawei | No | Current procedures are operated as if the PC5 RRC connection is newly established and everything starts from the very beginning. It seems, from this perspective, nothing is broken. The need of the changes is questionable. |
| vivo | Agree | We agree the rapporteur’s further clarification. Since the field of reset configuration is just to indicate that the full configuration should be applicable for the *RRCReconfigurationSidelink* message. |
| Xiaomi | No | This change would result in multiple rather big changes, including NBC, which should be avoided at this stage. So we prefer a simple solution, which is to release all the configuration. If TX UE could not ensure the connection should be released from both sides, it shall not send the rest indication. |
| CATT | Agree | Same understanding as rapporteur, and the current description ”release/clear all current radio configuration” is not proper. |
| ZTE | Agree |  |

**Q1-2: If agree to Q1-1, i.e., the intention is correct, do you think the CR in [2] is needed?**

1> release/clear current sidelink radio configuration of this destination received in the *RRCReconfigurationSidelink*;

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| --- | --- | --- |
| Company | Yes/No | ***Comment on the wording if any*** |
| Samsung | Yes |  |
| Nokia | comment | We agree to the intention, however the CR in [2] adds a so-far not-existing IE *sl-ResetList-r16* in ASN.1 -> so that seems a NBC and risks to create some UE compatibility issue. |
| MediaTek | Yes |  |
| vivo | Yes |  |
| CATT | Comment | We share the same view as Nokia. |
| ZTE | No | We agree the intention of this change. However, it is not necessary to capture the change, since the field description of *sl-resetconfig* has captured the intention explicitly as shown in following from our perspective:  ***sl-Resetconfig***  Indicates that the full configuration should be applicable for the *RRCReconfigurationSidelink* message. |

## Issue-2: DRB Release

According to the current spec, the DRB release is specified as follows

1> release the sidelink DRBs of this destination, in according to sub-clause 5.8.9.1a.1;

In [1], considering the bearer maybe bi-direction at least for RLC-AM, i.e., different from configuration-release, it is not feasible for Rx-UE to only release the bearer for a single direction, it is proposed to release all bearers but add back afterwards based on the configuration dedicated-RRC/SIB/Pre-configuration autonomously.

Otherwise, there would be a misalignment between UEs (the bearers have been released) and network (thought the bearers are still being used), or there is a need to trigger reconfiguration by network to re-add the bearers.

P2: For reset configuration, after bearer release, bearer(s) is to be re-added, based on the stored configuration received from dedicated-RRC/SIB/Pre-configuration.

**Q2-1: Do you agree that, during the re-set configuration, after DRB release, they are to be re-added, based on the stored configuration received from dedicated-RRC/SIB/Pre-configuration?**

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| Company | Agree/Not-agree | Comment |
| Samsung | Agree | We share the view as the rapporteur that this part needs to be clarified. |
| Nokia | Disagree | This seems applicable for RLC-AM only. For uni-directional bearer case, when a SL DRB is released why should they be re-added after the release ? |
| MediaTek | Agree | We understand that the bearer configuration at the UE should be aligned with what the network expects, so this seems to make sense. |
| Huawei | No | Current procedures are operated as if the PC5 RRC connection is newly established and everything starts from the very beginning. It seems, from this perspective, nothing is broken. The need of the changes is questionable. |
| vivo | See comments | We have some concerns for the bearer(s) re-added handling.  Because in current spec TS 38.331, the sidelink DRB addition procedure is specified both for UE1 and UE2 (in Figure 1 above) as following. However, current procedure for reset configuration is specified only for UE2. We are wondering if we need additional specification efforts to clarify how UE1 behaves if the bearer(s) is released and re-added by UE2.  From our perspective, we can live with current UE behavior to simply release all DRB(s) in UE1 and UE2. Otherwise, both UE1 and UE2 should be specified to align with such bearer(s) re-added handling.  5.8.9.1a.2.2 Sidelink DRB addition/modification operations  For the sidelink DRB, whose sidelink DRB addition conditions are met as in sub-clause 5.8.9.1a.2.1, the UE capable of NR sidelink communication that is configured by upper layers to perform NR sidelink communication shall:  1> for groupcast and broadcast; or  1> for unicast, if the sidelink DRB addition was trigggered due to the reception of the *RRCReconfigurationSidelink* message; or  1> for unicast, after receiving the *RRCReconfigurationCompleteSidelink* message, if the sidelink DRB addition was triggered due to the configuration received within the *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR* or indicated by upper layers:  2> if an SDAP entity for NR sidelink communication associated with the destination and the cast type of the sidelink DRB does not exist:  3> establish an SDAP entity for NR sidelink communication as specified in TS 37.324 [24] clause 5.1.1;  2> (re)configure the SDAP entity in accordance with the *sl-SDAP-ConfigPC5* received in the *RRCReconfigurationSidelink* or *sl-SDAP-Config* received in *sl-ConfigDedicatedNR*, *SIB12*, *SidelinkPreconfigNR*, associated with the sidelink DRB;  2> establish a PDCP entity for NR sidelink communication and configure it in accordance with the *sl-PDCP-ConfigPC5* received in the *RRCReconfigurationSidelink* or *sl-PDCP-Config* received in *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR*, associated with the sidelink DRB;  2> establish a RLC entity for NR sidelink communication and configure it in accordance with the *sl-RLC-ConfigPC5* received in the *RRCReconfigurationSidelink* or *sl-RLC-Config* received in *sl-ConfigDedicatedNR,* *SIB12*, *SidelinkPreconfigNR*, associated with sidelink DRB;  2> if this procedure was due to the reception of a *RRCReconfigurationSidelink* message:  3> configure the MAC entity with a logical channel in accordance with the *sl-MAC-LogicalChannelConfigPC5* received in the *RRCReconfigurationSidelink* associated with the sidelink DRB, and perform the sidelink UE information procedure in sub-caluse 5.8.3 for unicast if need;  2> else:  3> configure the MAC entity with a logical channel associated with the sidelink DRB, by assigning a new logical channel identity, in accordance with the *sl-MAC-LogicalChannelConfig* received in the *sl-ConfigDedicatedNR*, *SIB12*, *SidelinkPreconfigNR*.  NOTE 1: When a sidelink DRB addition is due to the configurationby *RRCReconfigurationSidelink*, it is up to UE implementation to select the sidelink DRB configuration as necessary transmitting parameters for the sidelink DRB, from the received *sl-ConfigDedicatedNR* (if in RRC\_CONNECTED), *SIB12* (if in RRC\_IDLE/INACTIVE), *SidelinkPreconfigNR* (if out of coverage) with the same RLC mode as the one configured in *RRCReconfigurationSidelink*. |
| Xiaomi | No | The DRB should be added according to the DRB addition procedure in 5.8.9.1a.2. |
| CATT | See comment | We think it is only applicable for bi-directional RLC AM SLRB. |
| ZTE | Agree |  |

**Q2-2: If agree to Q2-1, i.e., the intention is correct, do you think the CR in [2] is needed?**

1> perform the sidelink DRB addition procedure according to the current sidelink configuration of this destination, received in *sl-ConfigDedicatedNR,* *SIB12* and *SidelinkPreconfigNR*, according to sub-clause 5.8.9.1a.2;

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| Company | Yes/No | ***Comment on the wording if any*** |
| Samsung | Yes |  |
| MediaTek | Yes |  |
| vivo | See comments | As replied above in Q2-1. |
| ZTE | Yes with comments | We think “sl-configDedicatedNR” should be deleted from this sentence.  DRB release will cause RLC mode update and UE should report it to gNB via SUI. For UE2 in RRC Connected state, if sl-resetconfig is indicated in *RRCReconfigurationSidelink* received from UE1, UE2 will update the RLC mode information and the transmission of SUI will be triggered correspondingly. Then, gNB can reconfigure DRB via *RRCReconfiguration* signaling. In consequence, it is not necessary to capture “sl-configDedicatedNR” here. |
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## Issue-3: MAC Re-set

According to the current spec, the MAC re-set is specified as follows

1> reset the sidelink specific MAC of this destination.

In [1], it is observed that

* On the one hand, the MAC reset procedure is used by RLF and proactive PC5 link release (by upper layer) procedure as well, which requires both Tx side and Rx side reset;
* On the other hand, for reset configuration, it ideally only requires Rx side reset;

Given this gap, the result is waste of SL grant if the UE is configured as mode-1, i.e., although Rx-UE has cleared the Tx-buffer, but it is not known by gNB, which may further provide re-transmission SL grant to Rx-UE.

**Q3-1: Do you agree that, during the re-set configuration, according to the current spec, MAC re-set may lead to SL grant waste?**

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| Company | Agree/Not-agree | Comment |
| Samsung | See comment | We somewhat share the view as the rapporteur that the gNB can be informed about re-set especially in case of mode-1 configured. But no strong view and we are fine to follow majority view. |
| Nokia | comment | Q3-1 seems rather to promote that the RX-UE (UE2) informs its own gNB about the sl-reset. |
| MediaTek | Agree | We agree that the grant may be wasted; see the following questions for our views on what to do about it. |
| Huawei | Maybe; but not a serious problem needing further Spec impacts | Even if there is potentially SL resource wastage as claimed in the Tdoc, the issue may not be severe and can be detected/avoided by the NW via proper implementation, e.g. though the gNB cannot find an SL grant is not used as in Uu (by finding no PUSCH transmission received), it can realize the SL grant is not used via HARQ FB for SL. That is, if the NW wants to avoid such resource wastage (if really any), there is always a way for the NW to achieve the purpose by proper configuration, e.g. relying on SL related HARQ FB.  Therefore, any Spec change with this purpose should be regareded as some forms of optimization. Especially considering that the introduction of new signaling is NBC and also a new feature for optimization purpose, it should not be pursed at this stage for Rel-16. |
| vivo | See comment | We understand the intention of the rapporteur. But we slightly prefer not to handle this case with any specified solution, e.g. reporting, since the benefits may be less than the complexity/overhead. |
| Xiaomi | Comment | The SL grant may be wasted. But we don’t think the gain justify the NBC change, considering nothing is broken. |
| CATT | See comment | It seems not a serious problem, considering Rel-16 is frozen, it is unnecessary to handle it. |
| ZTE | See comment | Specifically speaking, only one retransmission SL grant may be wasted. If UE find the HARQ buffer is empty, it will ignore the retransmission SL grant and report ACK on PUCCH, and gNB will not schedule more retransmission SL grant.We think this is not a critical issue.  And, according to current specification, sidelink specific MAC reset not only includes TX related configuration, but also includes RX related configuration. However, Sidelink reset should only reset RX related configuration from RX UE perspective. We may need to further discuss whether it is suitable to capture “reset the sidelink specific MAC of this destination” in clause for Sidelink reset configuration. |

Considering that for RLF and proactive PC5 link, this issue is solved by SUI report, [1] proposes to adopt the same solution to solve it. So far, rapporteur has not identified other reasons for reset configuration report.

P3: RAN2 discuss whether to introduce reset indication in SUI to indicate the reception of sl-ResetConfig or not.

**Q3-2: Do you agree to introduce SUI report for reset configuration?**

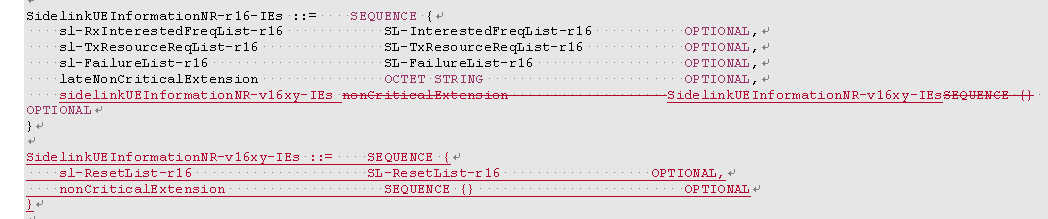
|  |  |  |
| --- | --- | --- |
| Company | Agree/Not-agree | Comment |
| Samsung |  | See the comment for Q3-1 |
| Nokia | Disagree for Rel.16 | Although adding *sl-ResetList-r16* into the Sidelink UE Information might help the gNB of UE-2. Anyway we think it is not critical to apply this change in Rel.16 since Rel.16 ASN.1 is frozen. |
| MediaTek | See comment | We see the benefit to avoid the waste of a grant, but it seems a bit of an optimisation, i.e. the system is not really broken without this change. We can accept the majority view on this.  To Nokia’s comment, we understand that what’s proposed in [2] is a normal non-critical extension and it does not violate the ASN.1 freeze or introduce an NBC issue. If the UE sends the new IE and the network does not understand it, the network will show legacy behaviour and the grant can be wasted; if the UE does not implement the new IE, it will never send it and the network will not know what was reset, so again a grant may be wasted. But the system doesn’t break in either case. |
| Huawei | No | See above comments for Q3-1. |
| vivo |  | See the above Q3-1. |
| Xiaomi | No | We think this is optimization. |
| CATT |  | See above comments for Q3-1. |
| ZTE | No | This is not a critical issue and considering the ASN.1 is frozen, we prefer not to agree this change. |

**Q3-3: if agree to Q3-2, do you think the CR in [2] is needed, which is to introduce SUI report for reset configuration?**

3> if the received *RRCReconfigurationSidelink* includes the *sl-ResetConfig*:

4> initiate transmission of the *SidelinkUEInformationNR* message to indicate the NR sidelink communication transmission resources required by the UE in accordance with 5.8.3.3;

And



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| Company | Yes/No | ***Comment on the wording if any*** |
| MediaTek | See comment | We don’t normally change the field name from “nonCriticalExtension”; we should just replace the empty SEQUENCE with the new type SidelinkUEInformationNR-v16xy-IEs. Otherwise the CR looks OK. |
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# Conclusion

We have the following proposals

[Proposal 1 xxx.](#_Toc62216175)

# Reference

1. R2-2100118 Left issue on reset configuration OPPO discussion Rel-16 5G\_V2X\_NRSL-Core
2. R2-2100115 Correction reset configuration OPPO CR Rel-16 38.331 16.3.1 2302 - F 5G\_V2X\_NRSL-Core