**3GPP TSG-RAN WG2 Meeting #121b-e R2-2304219**

**Online, 17th April– 26th April, 2023**

**Agenda item: 5.2**

**Source: ASUSTeK**

**Title: Summary on [AT121bis-e][502][V2X/SL] Clear SL CG (ASUSTeK)**

**Document for: Discussion & Decision**

 Introduction

This is to summarize the result of the following email discussion in RAN2#121bis-e:

* [AT121bis-e][502][V2X/SL] Clear SL CG (ASUSTek)

      **Scope:** Discuss corrections for

1) SL CG clearing at MAC reset, including 2574, 3210, 3915, 3928, and

      Identify CRs that can be agreed in principle with or without revision

      **Intended outcome:**

1. discussion summary in R2-2304219.
2. If needed, 38.321 CR in R2-2304220 for R16 and R2-2304221 for R17

**Deadline: Comeback** at 4/25 CB session

2 Contact Information

|  |  |
| --- | --- |
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| ASUSTeK | Xinra Kung (Xinra\_Kung@asus.com) |
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| Apple | Zhibin Wu. (Zhibin\_wu@apple.com) |

# 3 Discussion

In RAN2#121 meeting, there was a discussion regarding whether to clear configured sidelink grants when performing MAC reset and the conclusion was postponed:

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| (4, 11) Proposal 3. Correction (“Added that the UE clears configured sidelink grant when performing MAC reset.”) in R2-2301525 (For Rel-16)/R2-2301526 (For Rel-17) is not agreed.* Postponed.
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In the current specification, when a MAC entity performs MAC reset requested by RRC, the MAC entity considers the *timeAlignmentTimer* to be expired and performs the actions in clause 5.2, where the MAC entity clears any configured DL assignments and configured UL grants:

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| 5.12 MAC ResetIf a reset of the MAC entity is requested by upper layers, the MAC entity shall:1> consider all *timeAlignmentTimer*s as expired and perform the corresponding actions in clause 5.2;…5.2 Maintenance of Uplink Time Alignment…1> when a *timeAlignmentTimer* expires:3> clear any configured downlink assignments and configured uplink grants; |

and the MAC entity does not clear SL CG when performing MAC reset.

In RRC re-establishment (when T311 is running), the UE releases the SL CG type-1 resource but not the type-2 resources. The UE does not use type-2 CG when T310 is running based on the NOTE in 5.8.8:

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| 5.8.8 Sidelink communication transmission[…]3> if the UE is in RRC\_CONNECTED and uses the frequency included in *sl-ConfigDedicatedNR* within *RRCReconfiguration* message:4> if the UE is configured with *sl-ScheduledConfig*:[…]5> if T311 is running, configure the lower layers to release the resources indicated by *rrc-ConfiguredSidelinkGrant* (if any);[…]NOTE 1: The UE continues to use resources configured in *rrc-ConfiguredSidelinkGrant* (while T310 is running) until it is released (i.e. until T310 has expired). The UE does not use sidelink configured grant type 2 resources while T310 is running. |

In this meeting, there are several documents continuing the discussion.

In R2-2303915 [1] and its Rel-17 mirror R2-2303928, it is proposed to clear the sidelink grant when performing MAC reset in order to avoid collision of SL transmissions due to UE occupying SL CG in scenarios requiring MAC reset (e.g., the serving cell changes due to handover/RRC re-establishment), and to align with Uu CG handling where the MAC entity clears any configured DL assignments and configured UL grants:

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| 5.12 MAC ResetIf a reset of the MAC entity is requested by upper layers, the MAC entity shall:…1> cancel, if any, triggered configured sidelink grant confirmation;1> clear, if any, configured sidelink grants;1> cancel, if any, triggered Desired Guard Symbol query; |

On the other hand, R2-2302574 [2] and R2-2303210 [3] propose that clearing SL CG upon MAC-reset is not needed.

In [2], it is observed that the current spec requires UE to switch to mode-2/exceptional during handover, and the current spec requires the UE to stop using type-2 CG upon T310 start and release type-1 CG upon T311 start, there’s not enough motivation to pursue the change:

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| 1. For SL CG, current spec requires UE to switch to mode-2 using exceptional pool upon T304 start without clearing operation, to stop using type-2 CG upon T310 start, and to release type-1 CG upon T311 start.
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In [3], similar observation is provided that the UE is not allowed to use SL CG when T311 is running, and NW implementation can be leveraged when MAC reset is triggered by NW signalling:

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| **Observation 1: When T311 is running, UE is not allowed to use the configured SL grant based on current RRC specification, no need to duplicate in MAC.** **Observation 2: When T310 is running, if MAC reset is triggered by NW signalling, we can rely on NW implementation to release the configured SL grant.**  |

With the above contributions summarized, this email discussion respectfully asks for all companies’ view on whether to clear SL CG when performing MAC reset:

Q1: Do you agree the UE should clear configured sidelink grant when performing MAC reset?

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| **Company** | **Agree/Disagree** | **Detailed Comments** |
| ASUSTeK | Agree | For handover case, if the UE does not release/clear SL CG in MAC reset, the UE will switch to mode-1 and resume using the resources after handover to the target Cell. As the UE should not be allowed to use the resources in the target Cell, it is a burden for the Source Cell to be always required to deactivate/release the CG before handover.For RRC connection re-establishment case, if the UE does not release/clear SL type-2 CG in MAC reset, the UE will switch to mode-1 and resume using the resources after re-establishing to the target Cell. As the UE should not be allowed to use the resources in the target Cell, it is a burden for the target Cell to be always required to deactivate/release the SL type-2 CG after re-establishment. |
| Huawei, HiSilicon | Agree | 1. the current spec text for Uu grant clearing, it is said " consider all timeAlignmentTimers, inactivePosSRS-TimeAlignmentTimer, and cg-SDT-TimeAlignmentTimer, if configured, as expired and perform the corresponding actions in clause 5.2;" and in clause 5.2, UL CG grants are cleared. Please note this "consider all timers as expired" are "artificial" expiry when the MAC reset is requested by upper layers, not necessarily really expired. So the arguent that SL can use GNSS may be true but not really relevant when the timers are considered as expired. Also the syncronization is not about using absolute time from GNSS or from other time source, it is about syncronization on the border of frame/slot which is controlled with TA procedures. 2. NW implementation could have further actions regarding deactivating/deconfiguring "residul" grants however this would be more complicated, compared to "all cleared" reset and re-initilized the needed grants. It seems more natural to specify a "clean slate" "MAC reset" procedure, rather than keep tracking all the grants even after a reset action. 3. just above the proposed clearing action, there is action by UE "1> cancel, if any, triggered configured sidelink grant confirmation;" which clealy demontrates the intended UE behavior is to clear also the sidelink grant, otherwise it is problematic UE clear the triggered SL grant confirmation but still to use the SL grant. This would lead to misalgnment between the NT and the UE. If UE intends to still use the SL grant, it shall keep (not clear) the triggered SL grant confirmation and report it to the NT after MAC reset.  |
| vivo | Agree | As one proponent of the change. |
| Apple | Agree | We tend to agree with Huawei’s understanding that UL CG is also cleared when Uu MAC reset. So, SL MAC reset can result similär behavior to clear all SL CGs. |

**Conclusion 1: TBD**

Q2: If the answer to Q1 is yes, do you agree with the change in R2-2303915 (Rel-16 CR) and R2-2303928 (Rel-17 CR)?

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| **Company** | **Agree as is;Agree with changes;Disagree** | **Detailed Comments** |
| ASUSTeK | Agree as is |  |
| vivo | Agree as is |  |
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**Conclusion 2: TBD**

# Conclusion

**TBD**

# Reference

[1] R2-2303915 Corrections on MAC reset regarding configured sidelink grant ASUSTeK, Huawei, HiSilicon, Samsung, vivo

[2] R2-2302574 Left issue on SL CG clear during MAC-reset OPPO

[3] R2-2303210 Discussion on clear of SL CG upon MAC reset Xiaomi