**3GPP TSG RAN WG1 Meeting #103-E R1-** **200xxxx**

**e-Meeting, October 26th – November 13th, 2020**

**Source: Moderator (Intel Corporation)**

**Title: Discussion on [103-e-NR-Rel-16-V2X-15]**

**Agenda item: 7.2.4**

**Document for:** **Discussion and Decision**

Introduction

This contribution provides discussion on reply LS to R1-2009508 within the thread [103-e-NR-Rel-16-V2X-15].

[103-e-NR-Rel-16-V2X-15]: Email discussion/approval of reply LS to R1-2009508 by 11/9 – Sergey (Intel)

Discussion

RAN2 sent the following LS body:

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| RAN2 previously sent the LS to RAN1 in R2-2008585 including the issue on whether to perform reselection for dropped retransmission after checking whether there is(are) pre-empted resource(s). Meanwhile, RAN2 recognized that RAN1 made a new agreement on pre-emption in RAN1#102-e as follows:* *If periodic reservation is in use by a UE, and if pre-emption is enabled in a resource pool, the UE checks pre-emption for resources provided by MAC layer to L1, according to specified procedures*
	+ *L1 expects that MAC layer provides resources intended for transmission of one TB, which can fit to resource selection window of current TB of the UE, and for which the relevant priority is available*
	+ *If a resource is pre-empted, a re-selection for the pre-empted resource is triggered based on the specified step 1 and step 2 procedures,*
		- *with details up to UE implementations, including whether/how to set the reservation period in the re-selected resource*
	+ *FFS in TP phase how/where to capture this in specification*
		- *During the pre-emption checking, j is up to Cresel-1*

RAN2 understands that the above agreement is related to the step of checking whether there is(are) pre-empted resource(s) which has been specified in 38.321. RAN2 would like to ask RAN1 to clarify the above agreements that may impact MAC specification:**Q1: Does the TB in the above agreement correspond to only MAC PDU created for transmission?** **Q2: Is it correct understanding that whenever a MAC PDU is created, UE checks whether there is(are) pre-empted resource(s) among all remaining periodic reserved resources assuming that the periodic reserved resources are used for transmissions of potential MAC PDUs which have the same priority with the created MAC PDU?****Q3: Does RAN1 assume that only retransmission resources in periodic reservation are checked for pre-emption?**  |

In this section, the questions are discussed one-by-one.

## Reply to Q1

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| **Q1: Does the TB in the above agreement correspond to only MAC PDU created for transmission?**  |

In FL understanding, the answer to Q1 could be ‘yes’. The intention of the RAN1 agreement was to limit the set of resources {r’} passed to PHY layer to only the ones in current period / selection window. And according to another agreement, it is not possible to interlace TB/PDU between periods.

**Tentative reply**: Yes

**Internal question 1: Please share your views on Q1 and whether the above FL tentative conclusion is agreeable.**

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| **Source** | **Comments** |
| vivo | OK with FL reply |
| Qualcomm | Agree with the FL reply |
| Samsung | O.K with FL’s reply |
| OPPO | OK with FL reply |
| NTT DOCOMO | Support FL reply |
| LG | Agree with FL’s tentative conclusion |

**FL conclusion:**

* **Q1 reply**
	+ **Yes, it does**

## Reply to Q2

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| **Q2: Is it correct understanding that whenever a MAC PDU is created, UE checks whether there is(are) pre-empted resource(s) among all remaining periodic reserved resources assuming that the periodic reserved resources are used for transmissions of potential MAC PDUs which have the same priority with the created MAC PDU?** |

In FL understanding, the resources passed to PHY are still for one TB/PDU within one period/sensing window. However, since the range of j from 0 to Cresel-1 was not modified, effectively potential future collisions for other PDUs can be considered. This does not have any impact on the original assumption and intention of the RAN1 agreement.

**Tentative reply**: A UE checks whether there is(are) pre-empted resources(s) among resource within a current period limited by a selection window for current TB. However, since the pre-emption check procedure reuses generic steps of identifying a candidate resource set, the collision in future periods could be factored into the pre-emption condition. MAC layer is assumed to be agnostic whether the collision was identified for future periods or for current period.

**Added by OPPO:**

[Since the pre-emption check procedure reuses generic steps of identifying a candidate resource set, the collision in future periods could be factored into the pre-emption condition. MAC layer is assumed to be agnostic whether the collision was identified for future periods or for current period. Therefore, from MAC layer’s perspective, UE only checks whether there is(are) pre-empted resources(s) among resource within a current period limited by a selection window for current TB.]

**Internal question 2: Please share your views on Q2 and whether the above FL tentative conclusion is agreeable.**

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| **Source** | **Comments** |
| vivo | If my understanding is correct, RAN2 will decide whether only to deliver resource set in current period to PHY for pre-emption purpose. Thus, Only the first sentence is necessary, we do not need to give reason to RAN2. |
| Qualcomm | We agree with vivo’s view that only the first sentence is necessary. The second part could lead to cases where the UE detects a pre-empted resource in a future period but ends up also reselecting the resource in the current period. |
| Samsung | We share view with vivo and QC that only the first sentence is necessary. |
| OPPO | We fully agree with FL’s explanation and OK with just the first sentence (seem to be preferred by others so far). But we also see some value in giving RAN2 FL’s full explanation. Alternatively, we could move the first sentence to the end to avoid confusion, like:“Since the pre-emption check procedure reuses generic steps of identifying a candidate resource set, the collision in future periods could be factored into the pre-emption condition. MAC layer is assumed to be agnostic whether the collision was identified for future periods or for current period. Therefore, from MAC layer’s perspective, UE only checks whether there is(are) pre-empted resources(s) among resource within a current period limited by a selection window for current TB.” |
| NTT DOCOMO | We generally agree with FL’s proposal. Any of 1) original three sentences, 2) only the 1st sentence or 3) OPPO’s suggested moving the 1st sentence to the end is fine for us.  |
| LG | Generally agree with FL’s tentative conclusion, but not sure whether it is desirable to use the wording of “current period”. Since this wording doesn’t exist in RAN1 agreement, our preference is not to use it. In the reply LS, RAN1 needs to explain what assumption is used for PHY layer to check the pre-empted resource. In this sense, the first sentence only is not sufficient, which is not very different from the RAN1 agreement. To our understanding, the following sentence is aligned with RAN1’s agreed assumption for checking the occurrence of pre-empted resources “among resources within a current period limited by a selection window for the current TB”. If not, please let us know that. Assuming that this is correct understanding, we don’t see any reason to include the first sentence only in the reply LS. * *UE checks whether there is(are) pre-empted resource(s) among all remaining periodic reserved resources assuming that the periodic reserved resources are used for transmissions of potential MAC PDUs which have the same priority with the created MAC PDU*

**FL comment: actually according to the other companies replies, the RAN2 sentence is not fully accurate and could lead to MAC layer passing resources for pre-emption check for more than one TB / Period, that is counter the RAN1 agreements and replies to Q1. It is better to make MAC agnostic to collisions in future periods.** |

**FL conclusion based on the preference to keep one sentence**

* **Q2 reply**
	+ **For the cited RAN1 agreement, RAN1 assumes that a UE checks whether there is(are) pre-empted resources(s) among resources within current selection window for current TB**

## Reply to Q3

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| **Q3: Does RAN1 assume that only retransmission resources in periodic reservation are checked for pre-emption?**  |

In FL understanding, the initial transmission resources within a given period are also checked for pre-emption, since there is no exception to which resources could be subject to pre-emption.

**Tentative reply**: No, RAN1 does not assume that only retransmission resources in periodic reservation are checked for pre-emption. RAN1 assumes any resource can be checked for pre-emption subject to the conditions that it fits to current selection window.

**Internal question 3: Please share your views on Q3 and whether the above FL tentative conclusion is agreeable.**

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| **Source** | **Comments** |
| vivo | Generally fine with reply. Or directly feedback ‘both initial transmission and retransmission resource may be subject to the check.’, then RAN2 can consider the LS regarding check timing and this LS to finalize the spec. |
| Qualcomm | Agree with the FL reply |
| Samsung | O.K with FL’s reply |
| OPPO | Support FL’s reply with a minor update. RAN1 assumes any reserved resource can be checked for pre-emption subject to the conditions that it fits to current selection window. |
| NTT DOCOMO | Support FL’s proposal with OPPO’s update.  |
| LG | We prefer OPPO’s suggestion with additional modification, i.e., RAN1 assumes any reserved resource can be checked for pre-emption subject to the conditions that it fits to the resource selection window of current TB. Note that this version is more aligned with the wording of RAN1 agreement. |

**FL conclusion based on modifications from OPPO and LGE**

* **Q3 reply**
	+ **RAN1 assumes any reserved resource, regardless whether it is for an initial transmission or for a retransmission, are checked for pre-emption subject to the conditions that it fits to the resource selection window of current TB**