3GPP TSG-RAN WG2 Meeting #118-e R2-22xxxxx

Online, May 09 – May 20, 2022

**Agenda item: 5.1.3**

**Source: Samsung**

**Title: Offline 014: Rel-15/16 User Plane**

**Document for: Discussion & Decision**

# Introduction

This document is a summary of the following offline discussion:

* [AT118-e][014][NR1516] User Plane (Samsung)

Scope: Treat R2-2204755, R2-2204756, R2-2204757, R2-2205682, R2-2205717, R2-2205718, R2-2205715, R2-2205716,  
Ph1 Determine agreeable parts, Ph2 for agreeable parts agree CRs (offline agreement, CB online only if necessary).

Intended outcome: Report, Agreed CRs

Deadline: Schedule 1

The following contributions are discussed:

* 5.1.3.1 MAC

R2-2204755 Clarification on SR and PUSCH collision OPPO, Samsung CR Rel-15 38.321 15.13.0 1231 - F NR\_newRAT-Core

R2-2204756 Clarification on SR and PUSCH collision OPPO, Samsung CR Rel-16 38.321 16.8.0 1232 - F NR\_newRAT-Core, NR\_IIOT-Core

R2-2204757 Clarification on SR and PUSCH collision OPPO, Samsung CR Rel-17 38.321 17.0.0 1233 - A NR\_newRAT-Core, NR\_IIOT-Core

R2-2205682 CR for procedure level alignment of UL skipping Apple CR Rel-16 38.321 16.8.0 1192 1 D NR\_IIOT-Core R2-2202524

R2-2205717 Clarification on Duplication MAC CE Samsung CR Rel-16 38.321 16.8.0 1282 - F NR\_IIOT-Core

R2-2205718 Clarification on Duplication MAC CE Samsung CR Rel-17 38.321 17.0.0 1283 - A NR\_IIOT-Core

* 5.1.3.2 RLC PDCP SDAP BAP

R2-2205715 CR for EHC decompression Samsung CR Rel-16 36.323 16.5.0 0300 - F NR\_IIOT-Core

R2-2205716 CR for EHC decompression Samsung CR Rel-17 36.323 17.0.0 0301 - A NR\_IIOT-Core

# Contact Information

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# Discussion

## SR vs PUSCH Resource Overlap

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| R2-2204755 Clarification on SR and PUSCH collision OPPO, Samsung CR Rel-15 38.321 15.13.0 1231 - F NR\_newRAT-Core  R2-2204756 Clarification on SR and PUSCH collision OPPO, Samsung CR Rel-16 38.321 16.8.0 1232 - F NR\_newRAT-Core, NR\_IIOT-Core  R2-2204757 Clarification on SR and PUSCH collision OPPO, Samsung CR Rel-17 38.321 17.0.0 1233 - A NR\_newRAT-Core, NR\_IIOT-Core |

When the MAC determines if there is SR vs. data collision, the MAC entity checks SR vs. data collision in the MAC entity (cell group) and data is selected for transmission in Rel-15. However, when two PUCCH groups for one MAC entity is configured, simultaneous transmissions associated with different PUCCH groups are allowed from the RAN1 perspective. It is not captured in the MAC specification at all. R2-2204755 proposed a simple clarification to add “as specified in TS 38.213”

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| 1> else, for the SR configuration corresponding to the pending SR:  2> when the MAC entity has an SR transmission occasion on the valid PUCCH resource for SR configured; and  2> if *sr-ProhibitTimer* is not running at the time of the SR transmission occasion; and  2> if the PUCCH resource for the SR transmission occasion does not overlap with a measurement gap; and  2> if the PUCCH resource for the SR transmission occasion does not overlap with a UL-SCH resource as specified in TS 38.213 [6]:  3> if *SR\_COUNTER* < *sr-TransMax*:  4> increment *SR\_COUNTER* by 1;  4> instruct the physical layer to signal the SR on one valid PUCCH resource for SR;  4> start the *sr-ProhibitTimer*. |

**Q1. Do companies support the proposed change of R2-2204755 (Rel-15 NR) and 4766 (further updates on Rel-16 IIOT)?**

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| **Company** | **Yes/No** | **Comment** |
| vivo | No | In our understanding, whether there is an overlapping between the PUCCH and PUSCH is anyway estimated by PHY (i.e. only the PHY can interpret the FDRA/TDRA info of PUSCH) per PUCCH group level (the MAC may ask PHY to check whether there is overlapping and the PHY subsequently report the result to MAC). In this sense, the current spec is clear. We fail to see the motivation to capture anything in the MAC spec about parallel transmission on two PUCCH groups. |
| Qualcomm | No | Our understanding is that simultaneous Tx of SR and PUSCH is not supported in MAC is not because simultanous PUCCH+PUSCH transmission is not supported (at least in paper, cross-PUCCH group simultaneous transmission has been supported before R17), but because it is not necessary to send SR when PUSCH is sent. |
| Huawei, HiSilicon | No | Share view as QC. In R15, SR and PUSCH overlapping was discussed in both RAN1 and RAN2, and the conclusion was it is up to RAN2 that SR is not needed when PUSCH is available, so we think the current MAC spec is clear. |
| MediaTek | No |  |
| ZTE | No | Same view with above |
| Nokia | No | Agree with others for Rel-15 the check of overlapping PUCCH and PUSCH in MAC is per MAC entity, not per PUCCH group. |
| LG | No | Same view as QC. SR is not needed when PUSCH is available. |
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## Rel-16 PDCP Duplication MAC CE

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| R2-2205717 Clarification on Duplication MAC CE Samsung CR Rel-16 38.321 16.8.0 1282 - F NR\_IIOT-Core  R2-2205718 Clarification on Duplication MAC CE Samsung CR Rel-17 38.321 17.0.0 1283 - A NR\_IIOT-Core |

MAC specification captures a restriction that Rel-15 Duplication Activation/Deactivation MAC CE is not used if a DRB is configured with more than two RLC entities. However, the NOTE may be misleading, for example, the network cannot use Rel-15 Duplication MAC CE when a DRB is configured with 4 UM RLC entities (2 for each direction). In this case, Rel-15 MAC CE can be used. R2-2205717 proposed to clarify to cover bi-directional UM bearer as follows:

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| NOTE: The Duplication Activation/Deactivation MAC CE is not used if a DRB is configured with N UM RLC entities (for same direction), 2 × N UM RLC entities (N for each direction), or N AM RLC entities, where 2 < N <= 4. |

**Q2. Do companies support the proposed change of R2-2205717?**

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| **Company** | **Yes/No** | **Comment** |
| vivo | Yes with comments | We assume “N” should be written in italic, isn’t it? |
| Qualcomm | Yes | We think the change is necessary and correct. |
| Huawei, HiSilicon | No | This note has been discussed over several times. We would like to note that “more than two RLC entities” is configured by RRC where the details of moreThanTwoRLC-DRB-r16 is clearly specified in RRC. So we don't see much room of misunderstanding on the term. Otherwise, it implies the term of moreThanTwoRLC-DRB-r16 is also misleading, which we don't agree with. |
| MediaTek | No | Agree with Huawei. |
| ZTE | No | Agree with HW. |
| Nokia | No | Agree with Huawei. |
| LG | No | “more than two RLC entities” always means for each direction. If clarification is really needed, we can simply change as:  The Duplication Activation/Deactivation MAC CE is not used if a DRB is configured with more than two RLC entities (for each direction). |
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## EHC in LTE PDCP

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| R2-2205715 CR for EHC decompression Samsung CR Rel-16 36.323 16.5.0 0300 - F NR\_IIOT-Core  R2-2205716 CR for EHC decompression Samsung CR Rel-17 36.323 17.0.0 0301 - A NR\_IIOT-Core |

At PDCP re-establishment of an LTE PDCP entity configured with EHC and associated with at least one RLC entity configured with *rlc-OutOfOrderDelivery*, Ethernet header (EH) decompression should be performed before the delivery to the upper layer. However, it is missing in the PDCP spec. R2-2205715 proposed to add the procedure of EH decompression.

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| When upper layers request a PDCP re-establishment when the reordering function is used, the UE shall:  - process the PDCP Data PDUs that are received from lower layers due to the re-establishment of the lower layers, as specified in the clause 5.1.2.1.4;  - stop and reset *t-Reordering*, if running;  - if the PDCP entity is associated with at least one RLC entity configured with *rlc-OutOfOrderDelivery*:  - deliver all stored PDCP SDUs, if any, to upper layers in ascending order of associated COUNT values after performing header decompression (if configured) using EHC as specified in the clause 5.14.5;  - reset the EHC protocol for downlink (if configured) if *drb-ContinueEHC-DL* is not configured, see TS 36.331 [3];  - else;  deliver all stored PDCP SDUs, if any, to upper layers in ascending order of associated COUNT values.- set Next\_PDCP\_RX\_SN, and RX\_HFN to 0 and Last\_submitted\_PDCP\_RX\_SN to Maximum\_PDCP\_SN;  - apply the ciphering algorithm and key provided by upper layers during the re-establishment procedure. |

**Q3. Do companies support the proposed change of R2-2205715?**

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| **Company** | **Yes/No** | **Comment** |
| vivo | Yes with comments | We agree with the intention. And we slightly prefer the NR wording style.Specifically, we propose the following revision  When upper layers request a PDCP re-establishment when the reordering function is used, the UE shall:  - process the PDCP Data PDUs that are received from lower layers due to the re-establishment of the lower layers, as specified in the clause 5.1.2.1.4;  - stop and reset *t-Reordering*, if running;  - deliver all stored PDCP SDUs, if any, to upper layers in ascending order of associated COUNT values after performing header decompression (if configured) using EHC as specified in the clause 5.14.5;  - if the PDCP entity is associated with at least one RLC entity configured with *rlc-OutOfOrderDelivery*:  - reset the EHC protocol for downlink (if configured) if *drb-ContinueEHC-DL* is not configured, see TS 36.331 [3];  - set Next\_PDCP\_RX\_SN, and RX\_HFN to 0 and Last\_submitted\_PDCP\_RX\_SN to Maximum\_PDCP\_SN;  - apply the ciphering algorithm and key provided by upper layers during the re-establishment procedure. |
| Qualcomm | Yes | A very minor editorial comment: It seems better to move “if configured” after "using EHC”, i.e.   * deliver all stored PDCP SDUs, if any, to upper layers in ascending order of associated COUNT values after performing header decompression using EHC (if configured) as specified in the clause 5.14.5; |
| Huawei, HiSilicon | Yes with comments | Prefer the wording from vivo |
| MediaTek | Yes | Agree with vivo |
| ZTE | Yes | Vivo’s wording is simpler |
| Nokia | Yes with comments | Agree with the improvements from both vivo and Qualcomm. |
| LG | Yes with comments | Agree with the intention, but vivo change seems good together with QC suggestion.  - deliver all stored PDCP SDUs, if any, to upper layers in ascending order of associated COUNT values after performing header decompression using EHC (if configured) as specified in the clause 5.14.5; |
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## Level Alignment of UL Skipping

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| R2-2205682 CR for procedure level alignment of UL skipping Apple CR Rel-16 38.321 16.8.0 1192 1 D NR\_IIOT-Core R2-2202524 |

In RAN2#117-e, the proposed change was postponed because it’s a purely editorial category D CR which can be merged to other Rel-16 CR. R2-2205682 was resubmitted. The rapporteur assumes this CR will be merged by other 38.321 Rel-16 CR if there is an agreed category F CR.

**Q4. If you have any concern on R2-2205682, please share. (It is assumed that this CR does not need any technical discussion in this meeting.)**

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| **Company** | **Comment in case that you have any concern** |
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# Conclusion