3GPP TSG-RAN WG2 #119 R2-2209246

E-Conference, 17th – 29th August 2022

Agenda Item: 6.24.1

Source: Apple

**Title: Summary of [Post119-e][046][NR17] FR2 UL Gap MAC CR (Apple)**

Document for: Discussion and decision

# 1 Introduction

The is the summary of the following email discussion.

* [Post119-e][046][NR17] FR2 UL Gap MAC CR (Apple)

 Scope: Continue discussion from [AT119-e][030]. Take into account the late comment by ericsson. Allow wider participation

 Intended outcome: Agreed CR

 Deadline: Short

# 2 Discussion

For connivence, here is the relevant content from LS [1] on UE behavior during FR2 UL gap.

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| ***Procedure to be prioritized over UL gap:***When an UL gap overlaps with an uplink transmission in NR serving cells in FR2 single CC or FR2 intra-band CA, then the UE is not required to conduct any transmission during the UL gap on the NR serving cells other than those listed below:* UL signals belonging to random access procedure according to TS 38.321.
* the PUSCH transmissions due to configured grant (CG-PUSCH (type 1 and 2)).
* the valid CSI report and/or valid L1-RSRP report during SCell activation procedure, where the valid CSI report is valid CQI with non-zero CQI index defined in clause 5.2.2.1, TS 38.214 and the valid L1-RSRP report is non lowest L1-RSRP defined in clause 10.1.6.
* The UE need not apply UL gap prioritization rules specified above for SCell activation procedure if the time period between UL gap colliding with CSI report of non-zero CQI or L1-RSRP and the slot where the SCell activation MAC CE or CSI report activation command is received is less than [X, and X is >=10 ms].
* the PUCCH allocations for scheduling request (SR) and link recovery request (LRR) defined in clause 8.5.
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During the RAN2#119 meeting week, the CR in [4] didn’t receive any comments in 30 hours after Rapporteur provided the latest version to Inbox folder.

However, Ericsson provided a late comment copied below:

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| Excerpted from Robert Karlsson S (Ericsson) email (August 26, 2022)As this CR was created during the meeting, we did not notice it until now. We think this CR set a bad precedence by moving the GAP control from the MAC spec to the RAN4 spec with a reference. RAN4 may later include anything in the referenced section without consulting RAN2, and thus causing future issues for interoperability, for example scheduler interaction, that RAN2 shall be in control of. Instead, the list in section 5.30 needs to be updated with the input from RAN4. |

The reasoning why as the proponent company, we suggested to refer to RAN4 spec, is the UE behavior is too detailed and there is a possibility that RAN4 may update this part again later on. Motivation is to avoid the trouble in maintaining MAC spec.

In order to address Ericsson’s concern, below is another alternative to capture the UE behavior in FR2 UL gap into MAC spec.

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| 5.30 Handling of FR2 UL gapDuring the FR2 UL gap configured by *ul-GapFR2-Config* as specified in TS 38.331 [5], the MAC entity shall, on the Serving Cell(s) of FR2 single CC and intra-band CA, or on the Serving Cell(s) in FR2 band(s) where UE does not support UL transmission within FR2 UL gap:1> not conduct any transmission other than:2> Msg3 or the MSGA payload as specified in clause 5.4.2.2;2> UL-SCH for configured grant;2> the valid CSI report during SCell activation procedure where the valid CSI report is valid CQI with non-zero CQI index defined in TS 38.214 [7], Clause 5.2.2.1;2> the valid L1 RSRP report during SCell activation procedure, where the valid L1 RSRP report is non lowest L1 RSRP defined in TS 38.133 [11], Clause 10.1.6;2> the PUCCH transmission for scheduling request (SR), and link recovery request (LRR) defined in TS 38.133 [11], Clause 8.5. |

**Question 1: Please companies indicate their preference on the Options.**

* **Option 1: Referring to TS38.133, as in [4]**

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| 5.30 Handling of FR2 UL gapDuring the FR2 UL gap configured by *ul-GapFR2-Config* as specified in TS 38.331 [5], the MAC entity shall not conduct uplink transmission other than the exceptions listed in TS 38.133 [11], clause 9.1.11, on the Serving Cell(s) of FR2 single CC and intra-band CA, or on the Serving Cell(s) of FR2 inter-band CA where UE does not support UL transmission within FR2 UL gap. |

* **Option 2: Capture the detailed UE behaviour as below.**

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| 5.30 Handling of FR2 UL gapDuring the FR2 UL gap configured by *ul-GapFR2-Config* as specified in TS 38.331 [5], the MAC entity shall, on the Serving Cell(s) of FR2 single CC and intra-band CA, or on the Serving Cell(s) in FR2 band(s) where UE does not support UL transmission within FR2 UL gap:1> not conduct any transmission other than:2> Msg3 or the MSGA payload as specified in clause 5.4.2.2;2> UL-SCH for configured grant;2> the valid CSI report during SCell activation procedure where the valid CSI report is valid CQI with non-zero CQI index defined in TS 38.214 [7], Clause 5.2.2.1;2> the valid L1 RSRP report during SCell activation procedure, where the valid L1 RSRP report is non lowest L1 RSRP defined in TS 38.133 [11], Clause 10.1.6;2> the PUCCH transmission for scheduling request (SR), and link recovery request (LRR) defined in TS 38.133 [11], Clause 8.5. |

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| **Company** | **Option preferred** | **Comments to the change to TS38.321 above** |
| Samsung | Option 2? | Although both options require to refer to RAN4 (and RAN1) specifications anyway, Option 2 is fine with us to address the concern from Ericsson. |
| OPPO | Option 1 | We don’t see any problem with option 1. |
| Huawei, HiSilicon | Option 1 | We think option 1 helps reducing maintenance work. |
| Apple | Option 1 | As explained, the reasoning why we prefer referring to RAN4 spec is RAN4 may update this part again later. It’s not convenient to always track RAN4 discussion and reflect it into MAC spec.And, we also don’t see the problem of referring to RAN4 spec in MAC. |
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# 3 Conclusions

Per RAN2 chair guidance, it was concluded to go with Option 2.

**Proposal: Option 2 is agreed. Corresponding CR is to be finalized in next meeting.**

# 4 References

[1] R2-2206959 LS to RAN2 on UL gap in FR2 RF enhancement (R4-2211222; contact: Apple) RAN4 LS in Rel-17 NR\_RF\_FR2\_req\_enh2 To:RAN2 Cc:RAN1

[2] R2-2208931 Correction on FR2 UL gap Apple CR Rel-17 38.321 17.1.0 1399 - F NR\_RF\_FR2\_req\_enh2 LATE

[3] R2-2209083 Summary of [AT119-e][030][NR17] FR2 UL Gap MAC CR (Apple)

[4] R2-2209084 Correction on FR2 UL gap TS38.321 CR Apple