**3GPP TSG-RAN2 Meeting #113-e R2-21xxxxx**

**e-Meeting, 25 Jan - 05 Feb, 2021**

**Source: Offline discussion Rapporteur (ZTE)**

**Title: Summary of [AT113-e][503][2sRA] CRs on 2sRA User Plane and stage-2 (ZTE)**

**Agenda item:** **6.11.1**

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

# Introduction

 [AT113-e][503][2sRA] CRs on 2sRA User Plane and stage-2 (ZTE)

Scope:

  Discuss submitted CRs in the UP AI and the stage-2 CR.  Rapporteur will do preliminary assessment on criticality and need to have the CRs and companies can provide their views.

      Intended outcome:

  Agreeable CRs

      Deadline for providing comments:

  Companies comments/text suggestions and on need/criticality of the CRs– Jan. 27h

  Rapporteur to make suggestions on which CRs should be pursued further and any possible merges – Jan. 28th

  Updated CRs (the ones agreed to be pursued) from responsible companies Jan. 29th

**Deadline for company comments:**

**Friday 27th Jan’21 17:00 UTC**

# Discussion

## Stage-2 corrections

Only the following tdoc was submitted for stage-2:

[R2-2101813](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2101813.zip) Correction on the allowed uplink transmission without TA Huawei, HiSilicon, Nokia (Rapporteur) CR Rel-16 38.300 16.4.0 0343 - F NR\_2step\_RACH-Core

As noted in the CR, we forgot to add MSGA to the list of allowed transmissions when the UE is non-synchronised. So the change looks correct and can hopefully be agreed.

Rapporteur view: The change looks correct and can be agreed

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| Q 1.1: Do companies agree that the change proposed in R2-2101813 is essential? | | |
| Company | Y/N | Comments |
| vivo | Y | Agree with the rapporteur. |
| Nokia, Nokia Shanghai Bell | Y | The Stage-2 remains unclear and not in line with Stage-3. |
| Samsung | Y | Agree but change can be as follows: "otherwise, the L1 is considered non-synchronised (in which case uplink transmission can only take place on PRACH and on PUSCH for MsgA. |
| Ericsson | Y | Support clarification as suggested from Samsung |
| ZTE | Y |  |
| Intel | Y |  |
| OPPO | Y |  |
| Xiaomi | Y |  |
| HW | Y | Agree as it is. |
| Qualcomm | Y | Agree the change from Samsung. |
| LG | Y | Prefer Samsung’s text. We want to change “and” to “or” in Samsung’s text. |

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| Q 1.2: Are there any comments to the contents of R2-2101813? | |
| Company | Comments to the CR (if any) |
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**Summary:**

* All companies agree with the intention of the CR.
* Slight rewording has been proposed to the text by some companies (but will not change the actual intention), so the assumption is that this rewording is not critical (i.e. matter of taste)
* Given that the original text has been endorsed by the stage-2 rapporteur, the recommendation is to just go with the majority view that the CR is agreed as it is.

**Proposal 1: Agree the CR in R2-2101813**

## UP corrections

* RA-RNTI usage:

There is one CR on RA-RNTI usage from Vivo:

R2-2100349 Correction on Usage of RA-RNTI in 2-step RA procedure vivo CR Rel-16 38.321 16.3.0 1015 - F NR\_2step\_RACH-Core

The proposal is to include RA-RNTI for UL-SCH in Table 7.1-2 of the MAC spec.

Although it is true that RA-RNTI is used for generation of the PUSCH scrambling code for MSGA, the usage of the RNTI for this purpose seems different to the “RNTI usage” mentioned in this table in the MAC spec. The table in the MAC spec seem mainly about the usage of RNTI for the monitoring of the channel (i.e. CRC being scrambled with this RNTI). So, it seems misleading to add this to this table as proposed – as the way RA-RNTI is used for MSGA is different – i.e. it is used in initialisation of the scrambling code not for masking the CRC?

Rapporteur view: The change is not critical and not needed

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| Q 2.1: Do companies agree that the change proposed R2-2100349 in is essential? | | |
| Company | Y/N | Comments |
| vivo | Y | Firstly, we would like to clarify that CRC scrambling with RNTI mentioned by the rapporteur is for the downlink DCI (i.e. the 16 LSB bits of DCI CRC is further additionally scrambled with RNTI related sequence). The CRC scrambling method for PUSCH is totally different than that of PDCCH (additional scrambling is not needed for PUSCH). Herein, we are discussing the PUSCH transmission, not the PDCCH reception.  Secondly, please note that in the current MAC spec, the usage of TC-RNTI for Msg3 transmission has been explicated specified as follows,    And it is easily known that the TC-RNTI is used for Msg3 PUSCH scrambling according to the following quoted text in sub-clause 6.3.1.1 in 38.211,  The scrambling sequence generator shall be initialized with  where  equals the RA-RNTI for msgA and otherwise corresponds to the RNTI associated with the PUSCH transmission as described in clause 6.1 of [6, TS 38.214] and clause 8.3 of [5, TS 38.213].  Based on this, it makes no sense to preclude the usage of RA-RNTI of MsgA transmission for UL-SCH transport channel, which is actually similar to Msg3 transmission. |
| Nokia, Nokia Shanghai Bell | N | The TC-RNTI is listed for Msg3 transmission given the re-transmission grants scheduled by TC-RNTI. |
| Samsung | N | No need to capture in MAC spec |
| Ericsson | N | Not needed. |
| ZTE | N | If the understanding is that this table is mainly about scheduling (as seems to be the case from some the comments so far), then we think there is no need to change anything. If majority think this needs to be included, then it is worth clarifying how the RNTI is used (since the usage is not same in all cases then). |
| Intel | N | Not needed. |
| OPPO | N |  |
| Xiaomi | N | Table 7.1-2 seems referring to the scheduling. |
| HW | N |  |
| Qualcomm | N |  |
| LG | N |  |

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| Q 2.2: Are there any comments to the contents of R2-2100349? | |
| Company | Comments to the CR if you think the change should be adopted |
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**Summary:**

* Majority view is that this change is not needed

**Proposal 2: CR in R2-2100349 is not pursued**

* Clarification on when to consider UL-SCH resources to be available:

The following 3 tdocs discuss the issue of clarifying when the UL-SCH resources are considered available:

R2-2100350 Correction on UL-SCH resource in 2-step RA procedure vivo CR Rel-16 38.321 16.3.0 1016 - F NR\_2step\_RACH-Core

R2-2101512 38321 CR Correction on available UL-SCH resource LG Electronics Inc. CR Rel-16 38.321 16.3.0 1037 - F NR\_2step\_RACH-Core

R2-2101811 Correction on BSR for two-step RA Huawei, HiSilicon CR Rel-16 38.321 16.3.0 0981 1 F NR\_2step\_RACH-Core R2-2010402

There was some discussion in this issue already at the last meeting and the following is the copy of the chairman’s notes:

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| - ZTE is fine with the change but is wondering why we don’t mention mgs3.  - LG suggests to maybe keep the note only applicable to CG instead and remove dynamic grant  - Vivo thinks that we don’t have enough space to include the MAC CE and this is more of an optimization than a clarification  - Oppo thinks that the change is not need and also wonder why this note doesn’t capture the 4-step RA case  - Ericson and Lenovo explain that the UE is allowed to multiplex but in most cases there won’t be enough space, but the UE is allowed to do it.  - LG explains that when we added the note the only thing that was ambiguous was for CG case, for all other case it was already clear that the US-SCH resources are available.  - Apple also doesn’t think we need to list all of the cases and the only useful sentence is the last sentence.  - Huawei would prefer to not modify legacy text but if it removes ambiguity, we would be ok  - Mediatek agrees with Nokia that we can substitute the uplink grants with one generic uplink grant so it is applicable to all grants and future proof.  => The RAN2 understanding is that the UE is allowed to multiplex BSR in msgA and msg3. FFS if anything needs to be changed in the text and we would need to ensure that there are no issues with NR-U  => The CR is postponed |

So, based on the above, the CR should be applicable to both 2-step and 4-step RACH (i.e. MSGA and MSG3) and any change should be compatible with NR-U.

Vivo (clarify for 2-step RA only): It seems that R2-2100350 only proposes the change for 2-step RACH but not for 4-step RACH.

LG (general clarification): The change in [R2-2101512](file:///C:\evutukuri\work\5G\RAN2\docs\R2-2101512.zip) modifies the text in such way that the condition is generalized (i.e. not just for RA procedure but seems the intention is to apply this for any procedure)

HW (Clarification for both 2-step and 4-step RA): The change in R2-2101811 seems to include both 2-step and 4-step RA, as intended at RAN2#112e.

Rapporteur view: The change is useful, HW CR seems to implement it according to what was agreed at the last meeting.

So, based on the above, the first question is whether this change is essential:

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| Q 3.1: Do companies agree that the updates to Note 2 in section 5.4.5 to capture the missing scenarios – specifically those for RACH – are essential? | | |
| Company | Y/N | Comments |
| Vivo | Y | 2-step RA procedure triggered for SR is not considered in the current spec. |
| Nokia, Nokia Shanghai Bell | N | This is a NOTE so it seems not to preclude MsgA PUSCH nor Msg3. But can be clarified if most of the companies see it beneficial. |
| Samsung | Y |  |
| Ericsson | N | Not essential, but may be useful. Assuming that a MSGA transmission has been initiated, then once msgA is built the BSR should be multiplexed. The note needs then to be updated to reflect that when the BSR is triggered UL-SCH resource should be considered available (not trigger SR) through MSGA, otherwise the BSR will not be included. |
| ZTE | Y | It seems there is some confusion about this part and it is worth clarifying for all scenarios |
| Intel | Y | It is good to clarify |
| OPPO | Y | We’re open to clarify. |
| Xiaomi | N | Not essential clarification and makes the specification even more difficult for maintenance. In LTE 36.321, we have the same condition for the BSR “if UL-SCH resources are available for a new transmission”, and the specificiaotn of 36.331 works properly without such note for clarification. |
| HW | Y | Given the situation so far, we think there is indeed some ambiguity of the relevant note and therefore, it is good to clarify to avoid confusion by implementing the common understanding we had made in the last RAN2 meeting. |
| Qualcomm | Y |  |
| LG | Y |  |

Summary:

* Majority view (8/11) is that a clarification is useful
* Of the companies that said No, only one company seem to think that this definitely not needed (the others seem okay to clarify)
* Based on this, it seems some clarification could be useful and will be acceptable/supported by a significant majority

**Proposal 3: RAN2 aims clarify the Note 2 in section 5.4.5 and Note 1 in 5.22.1.6 to capture the missing scenarios**

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| Q 3.2: Assuming we need a change, which approach do companies prefer? – in the comments please also include any views on the specific change and whether the change is compatible with other features (e.g. NR-U etc) | | |
| Company | Vivo/LG/HW | Comments |
| vivo | vivo | Based on the UL grant definition in sub-clasue 5.4.1. in MAC spec,  Uplink grant is either received dynamically on the PDCCH, in a Random Access Response, configured semi-persistently by RRC or determined to be associated with the PUSCH resource of MSGA as specified in clause 5.1.2a.  we can know that the RAR grant is already a kind of dynamic grant. So we don’t need to consider the Msg3 case. This is why Msg3 is not included in the current MAC spec and no issues is found in the reality.  Besides, the impact on SL-BSR needs to be considered as well since a RA procedure can be triggered for an SL-BSR. |
| Nokia, Nokia Shanghai Bell | LG | Seems to be the simplest and futureproof solution. However, the exact wording should be discussed further. |
| Samsung | LG | Seems simplest |
| Ericsson | LG | Wording can be somewhat improved. |
| ZTE | LG/HW | Happy with to go with majority view:  **If we go with LG approach we propose slight rewording:**  Since we use the terminology of “determined grant” for MSGA payload and for all other cases it is either received or configured, we propose something like below:  *UL-SCH resources are considered available if the MAC entity has been configured with or receives or determines an uplink grant*  **If we go with HW approach, we also propose a similar update:**  *UL-SCH resources are also considered as availble if 2-step or 4-step RA type is triggered and the MAC entity has available UL grant, either determined as specified in clause 5.1.2a for the transmission of the MSGA payload or received in a Random Access Response.* |
| Intel |  | I think the question is whether to list down the different cases or just make it more generic. Not strong preference either way. |
| OPPO |  | We slightly prefer the wording from LG |
| Xiaomi | LG |  |
| HW | HW | We understand MsgA is different from Msg3 where Msg3 is scheduled by RAR while the MsgA PUSCH is pre-configured. Therefore, it would be good to clarify the condition that MsgA PUSCH resource is considered as “available” upon 2-step RA is triggered as in R2-2101811. And the motivation is similar to the text on the CG where it can be considered as “available” upon CG is activated. So we think the CR from HW is the only clear one with above clarification. |
| Qualcomm | HW | We prefer to not modify the legacy text but to add the new text to list all possible types of UL-SCH. |
| LG | LG | We are open for further text improvement, keeping the principle that the text is future proof. |

Summary:

* Majority view is to go ahead with a general clarification (i.e. based on LG text).
* It was mentioned that we should clarify that MSGA resources are considered available only when 2-step RACH is triggered
* It was also mentioned that preferably legacy text is not touched (but this seems a matter of taste since we are going to update this clause anyway)
* Given the majority view to go with a general clarification, we could adopt LG proposal as baseline.
* Perhaps this could be updated to accommodate some of the comments above:

e.g: *UL-SCH resources are considered available if the MAC entity has been configured with or receives or determines an uplink grant*

* Since the MAC entity will receive or determine the UL grant (for 4-step and 2-step RACH respectively) only when the corresponding RACH procedure is triggered, adding those words in the above text seems to address the concerns mentioned and this will go with the majority view that we want a more genral text (i.e. future proof).

**Proposal 4: LG to provide an updated CR with the modification as below (for Note 2 in 5.4.5 and Note 1 5.22.1.6):**

*UL-SCH resources are considered available if the MAC entity has been configured with or receives or determines an uplink grant*

* Conditions to stop ongoing RA procedure:

There are couple of CRs on the conditions to stop ongoing RA:

R2-2101838 Conditions to stop an ongoing RA procedure Asia Pacific Telecom, FGI CR Rel-16 38.321 16.3.0 1054 - F NR\_2step\_RACH-Core Withdrawn

R2-2101857 Conditions to stop an ongoing RA procedure Asia Pacific Telecom, FGI CR Rel-16 38.321 16.3.0 1055 - F NR\_2step\_RACH-Core

The proposed change in both CRs is fairly similar and is about the following text (or similar):

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| a MAC PDU is transmitted using a UL grant other than a UL grant provided by Random Access Response and other than a UL grant determined as specified in clause 5.1.2a for the transmission of the MSGA payload, and this PDU includes a BSR MAC CE which contains buffer status up to (and including) the last event that triggered a BSR (see clause 5.4.5) prior to the MAC PDU assembly; |

It seems the confusion is whether the “**other than**” clause above applies **to both** “a UL grant provided by Random Access Response” and “a UL grant determined as specified in clause 5.1.2a for the transmission of the MSGA payload” according to the original text or not? It seems the original text is fine from this perpective (i.e. it is clear that the “other than” clause applies to both the above conditions). So, seems the change is not needed?

Rapporteur view: The change is not needed

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| Q 3.1: Do companies agree that the changes proposed R2-2101838 and R2-2101857 are essential? | | |
| Company | Y/N | Comments |
| vivo | N | Agree with the rapporteur. The current spec is clear enough. |
| APT | Y | The intended UE behavior is to exclude both UL grant provided by RAR and UL grant for MSGA payload transmission.  Moreover, based on De Morgan's Law:  **other than A and other than B** is equivalent to **other than (A or B)**  However, what has been captured in TS 38.321 is **other than A or B**, instead of **other than (A or B)**.  Hence, from our perspective, it is better to make the specification clearer by adopting the proposed CR. |
| Nokia, Nokia Shanghai Bell | Y | The current text is ambiguous indeed. |
| Samsung | See comment | Current text seems to have same meaning as intended by proponent. However, we are also ok to make the suggested change for clarity |
| Ericsson | Y | Clarification is useful. |
| ZTE | N | Our understanding is that the new wording proposed and the existing wording mean the same. |
| Intel | N | We are not sure there is ambiquity with the current text. |
| OPPO | Y | Our original understanding is to apply both, but open to have this change if majorities think there was ambiguity. |
| Xiaomi | Y | It is better to clarify the ambiguity of the current specification text. |
| HW | N |  |
| Qualcomm | N | Current text is clear enough. |
| LG | N | We think current text is clear. |

Summary:

* It seems there is common understanding about the intended behaviour:
  + i.e. the “**other than**” clause above applies **to both** “a UL grant provided by Random Access Response” and “a UL grant determined as specified in clause 5.1.2a for the transmission of the MSGA payload”
* There is disagreement on whether the current text means the same as the intended behaviour or not
* Majority of companies seem to think there is no need to change the existing text (7/12)
* Seems there is no consensus on need to change the text. So, it is proposed not to pursue this.

**Proposal 5: The CRs R2-2101838 and R2-2101857 are not pursued**

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| Q 3.2: Assuming companies think the changes are needed, please provide any further feedback to the CRs in R2-2101838 and R2-2101857 | |
| Company | Comments to the CR |
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# Conclusions and proposals

**Proposal 1: Agree the CR in R2-2101813**

**Proposal 2: CR in R2-2100349 is not pursued**

**Proposal 3: RAN2 aims clarify the Note 2 in section 5.4.5 and Note 1 in 5.22.1.6 to capture the missing scenarios**

**Proposal 4: LG to provide an updated CR with the modification as below (for Note 2 in 5.4.5 and Note 1 5.22.1.6):**

*UL-SCH resources are considered available if the MAC entity has been configured with or receives or determines an uplink grant*

**Proposal 5: The CRs R2-2101838 and R2-2101857 are not pursued**

# References

R2-2101813 Correction on the allowed uplink transmission without TA Huawei, HiSilicon, Nokia (Rapporteur) CR Rel-16 38.300 16.4.0 0343 - F NR\_2step\_RACH-Core

R2-2100349 Correction on Usage of RA-RNTI in 2-step RA procedure vivo CR Rel-16 38.321 16.3.0 1015 - F NR\_2step\_RACH-Core

R2-2100350 Correction on UL-SCH resource in 2-step RA procedure vivo CR Rel-16 38.321 16.3.0 1016 - F NR\_2step\_RACH-Core

R2-2101512 38321 CR Correction on available UL-SCH resource LG Electronics Inc. CR Rel-16 38.321 16.3.0 1037 - F NR\_2step\_RACH-Core

R2-2101811 Correction on BSR for two-step RA Huawei, HiSilicon CR Rel-16 38.321 16.3.0 0981 1 F NR\_2step\_RACH-Core R2-2010402

R2-2101838 Conditions to stop an ongoing RA procedure Asia Pacific Telecom, FGI CR Rel-16 38.321 16.3.0 1054 - F NR\_2step\_RACH-Core Withdrawn

R2-2101857 Conditions to stop an ongoing RA procedure Asia Pacific Telecom, FGI CR Rel-16 38.321 16.3.0 1055 - F NR\_2step\_RACH-Core

# Annex (contact details for email discussions)

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| --- | --- | --- |
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