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

**e-Meeting, Oct 26th – Nov 13th, 2020**

**Agenda Item: 7.2.1**

**Source: Moderator (ZTE)**

**Title: FL summary on the maintenance of 2-step RACH**

**Document for: Discussion**

# Introduction

This document contains the summary of issues related to the maintenance of Rel-16 2-step RACH WI in RAN1#103-e meeting.

# Maintenance issues

The following 5 issues are identified based on the submitted contributions in RAN1#103-e.

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| Issue # | Description | Related TDoc # |
| 1 | Capture a missing agreement in 38.213 on the MsgA configuration for unlicensed band | R1-2007963, TP#1 |
| 2 | Editorial change on the “HARQ Feedback Timing Indicator” in 38.213 | R1-2008418, TP#1 |
| 3 | Correction on the mistaken implementation of a previously agreed TP in 38.211 | R1-2008785, TP#1 |
| 4 | Correction on the PUSCH occasion validation rule in 38.213 | R1-2008785, TP#2 |
| 5 | Alignment on the RRC parameter names in RAN1 specs | R1-2008660, TP#1~4 |
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*FL comments:*

Regarding #Issue 1, although the previous agreement was made in 2-step RACH WI, it was still been discussing in the NR-U session (7.2.2.1.1) in the last meeting, so it is preferably handled in NR-U session.

#Issue 5 has been covered by Editors’ draft CRs, i.e. R1-2007794 for 38.211, R1-2008124 for 38.213 and R1-2008292 for 38.214.

#Issue 2,3,4 can be considered for email discussions.

# Summary

The following Email discussion is proposed (will be updated based on companies’ feedback, if any).

Proposed Email thread #1:

Editorial and corrections including the following issues:

* TP#1 in R1-2008418 (editorial)
* TP#1 in R1-2008785 (correction)
* TP#2 in R1-2008785 (correction/clarification)

Any comments?

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| Company | Comment |
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# References

1. R1-2007963 Text proposal on the MsgA configuration in unlicensed band ZTE, Sanechips
2. R1-2008418 Maintenance of Two step RACH Ericsson
3. R1-2008660 Miscellaneous corrections for 2-step RACH vivo
4. R1-2008785 Remaining issues for 2-step RACH Huawei, HiSilicon
5. R1-2007794 Alignment of RRC parameter names Ericsson
6. R1-2008124 Alignment CR for TS 38.213 Samsung
7. R1-2008292 Alignment of RRC parameter names for 38.214 Nokia, Nokia Shanghai Bell

# Appendix

List of proposals in the submitted contributions.

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| TDoc | Proposals |
| R1-2007963, ZTE | **Proposal 1:** * Adopt the following TP#1 to TS38.213

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| **Reasons for change**To capture the agreement in the specification**Summary of changes**All msgA PUSCH occasions and the associated msgA RACH occasions are confined within a single RB set**Specs/Sections impacted**TS 38.213, Section 8.1A**Consequences if not approved:**MsgA PRACH or PUSCH may across multiple RB sets================ Start of TP1 for TS 38.213 ========================8.1A PUSCH for Type-2 random access procedure \*\*\* Unchanged text omitted \*\*\*A UE determines a first interlace or first RB for a first PUSCH occasion in an active UL BWP respectively from *interlaceIndexFirstPO-MsgA-PUSCH* or from *frequencyStartMsgA-PUSCH* that provides an offset, in number of RBs in the active UL BWP, from a first RB of the active UL BWP. A PUSCH occasion includes a number of interlaces or a number of RBs provided by *nrofInterlacesPerMsgA-PO* or by *nrofPRBs-perMsgA-PO*, respectively. Consecutive PUSCH occasions in the frequency domain of an UL BWP are separated by a number of RBs provided by *guardBandMsgA-PUSCH*. A number $N\_{f} $of PUSCH occasions in the frequency domain of an UL BWP is provided by *nrofMsgA-PO-FDM*. For operation with shared spectrum channel access, all PUSCH occasions and the associated RACH occasions are confined within a single RB set.\*\*\* Unchanged text omitted \*\*\*==================== End of TP1 =============================== |

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| R1-2008418,Ericsson | 1. To avoid inconsistency with the MAC specification, use “HARQ Feedback Timing Indicator” in 38.213 section 8.2A for indication of the PUCCH timing for MsgB HARQ feedback, according to text proposal TP1.

--------------------------start of TP1 for 38.213 section 8.2A---------------------------------🡨-----------------------------unchanged text omitted------------------------------------------🡪8.2A Random access response - Type-2 random access procedureIf the UE detects the DCI format 1\_0, with CRC scrambled by the corresponding MsgB-RNTI and LSBs of a SFN field in the DCI format 1\_0, if applicable, are same as corresponding LSBs of the SFN where the UE transmitted PRACH, and the UE receives a transport block in a corresponding PDSCH within the window, the UE passes the transport block to higher layers. The higher layers indicate to the physical layer- an uplink grant if the RAR message(s) is for fallbackRAR and a random access preamble identity (RAPID) associated with the PRACH transmission is identified, and the UE procedure continues as described in Clauses 8.2, 8.3, and 8.4 when the UE detects a RAR UL grant, or- transmission of a PUCCH with HARQ-ACK information having ACK value if the RAR message(s) is for successRAR, where - a PUCCH resource for the transmission of the PUCCH is indicated by PUCCH resource indicator field of 4 bits in the successRAR from a PUCCH resource set that is provided by *pucch-ResourceCommon* - a slot for the PUCCH transmission is indicated by a ~~PDSCH-to-HARQ\_feedback~~ HARQ Feedback ~~t~~Timing ~~i~~Indicator field of 3 bits in the successRAR having a value $k$ from {1, 2, 3, 4, 5, 6, 7, 8} and, with reference to slots for PUCCH transmission having duration $T\_{slot}$, the slot is determined as $n+k+∆$, where $n$ is a slot of the PDSCH reception and $∆$ is as defined for PUSCH transmission in Table 6.1.2.1.1-5 of [6, TS 38.214]- the UE does not expect the first symbol of the PUCCH transmission to be after the last symbol of the PDSCH reception by a time smaller than $N\_{T,1}+0.5$ msec where $N\_{T,1}$ is the PDSCH processing time for UE processing capability 1 [6, TS 38.214]- for operation with shared spectrum channel access, a channel access type and CP extension [15, TS 37.213] for a PUCCH transmission is indicated by a ChannelAccess-CPext field in the successRAR - the PUCCH transmission is with a same spatial domain transmission filter and in a same active UL BWP as a last PUSCH transmission🡨---------------------------------unchanged text omitted--------------------------------------🡪---------------------------------------end of TP1------------------------------------------------- |
| R1-2008660, vivo | **Proposal 1:** **Adopt the text proposal #1 for 38.213.**-----------------start of TP #1 for 38.213-------------------------7.1.1 UE behaviour<Unchanged part omitted>$j=0$, $P\_{O\\_UE\\_PUSCH,b,f,c}(0)=0$, and $P\_{O\\_NOMINAL\\_PUSCH,f,c}(0)=P\_{O\\_PRE}+Δ\_{MsgA\\_PUSCH}$, where $P\_{O\\_PRE}$ is provided by *preambleReceivedTargetPower* and $Δ\_{MsgA\\_PUSCH}$ is provided by *msgA-DeltaPreamble*, or $Δ\_{MsgA\\_PUSCH}=Δ\_{PREAMBLE\\_Msg3}$ dB if *msgA-DeltaPreamble* is not provided, for carrier $f$ of serving cell $c$----------------end-------------------------**Proposal 2:** **Adopt the text proposal #2 for 38.211.**-----------------start of TP #2 for 38.211-------------------------6.3.1.1 Scrambling<Unchanged part omitted>$$c\_{init}=\left\{\begin{matrix}n\_{RNTI}∙2^{16}+n\_{RAPID}∙2^{10}+n\_{ID}&for msgA on PUSCH\\n\_{RNTI}∙2^{15}+n\_{ID}&otherwise\end{matrix}\right.$$where-  equals the higher-layer parameter *dataScramblingIdentityPUSCH* if configured and the RNTI equals the C-RNTI, MCS-C-RNTI, SP-CSI-RNTI or CS-RNTI, and the transmission is not scheduled using DCI format 0\_0 in a common search space;- $n\_{ID}\in \left\{0,1,…,1023\right\}$ equals the higher-layer parameter *msgA-DataScramblingIndex* if configured and the PUSCH transmission is triggered by a Type-2 random access procedure as described in clause 8.1A of [5, TS 38.213];-  otherwise----------------end-------------------------**Proposal 3:** **Adopt the text proposal #3 for 38.211.**-----------------start of TP #3 for 38.211-------------------------6.3.3.2 Mapping to physical resources<Unchanged part omitted>Random access preambles can only be transmitted in the time resources obtained from Tables 6.3.3.2-2 to 6.3.3.2-4 and depends on FR1 or FR2 and the spectrum type as defined in [8, TS38.104]. The PRACH configuration index in Tables 6.3.3.2-2 to 6.3.3.2-4 is- for Table 6.3.3.2-3 given by the higher-layer parameter *prach-ConfigurationIndex-v1610* if configured, otherwise by the higher-layer parameter *prach-ConfigurationIndex,* or by *msgA-PRACH-ConfigurationIndex* if configured; and- for Tables 6.3.3.2-2 and 6.3.3.2-4 given by the higher-layer parameter *prach-ConfigurationIndex,* or by *msgA-PRACH-ConfigurationIndex* if configured.----------------end-------------------------**Proposal 4:** **Adopt the text proposal #4 for 38.214.**-----------------start of TP #4 for 38.214-------------------------6.1.4.1 Modulation order and target code rate determination<Unchanged part omitted>- elseif for a MsgA PUSCH transmission,- the UE shall use higher layer parameter *msgA-MCS* for *IMCS* and Table 6.1.4.1-1 to determine the Target code rate (*R*) used in the physical uplink shared channel.----------------end------------------------- |
| R1-2008785, Huawei | Text proposal #1 for TS 38.211:

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| **Reasons for change**To capture the previous decision into the TS 38.211**Summary of changes**Implement the above update**Specs/Sections impacted**TS 38.211, Section 6.4.1.1.1.1---------------------**Text proposal #1 starts for TS 38.211** ------------------------6.4 Physical signals6.4.1 Reference signals6.4.1.1 Demodulation reference signal for PUSCH6.4.1.1.1 Sequence generation6.4.1.1.1.1 Sequence generation when transform precoding is disabled<Unchanged Text Omitted>The quantity $n\_{SCID}\in \left\{0,1\right\}$ is- indicated by the DM-RS initialization field, if present, either in the DCI associated with the PUSCH transmission if DCI format 0\_1 or 0\_2, in [4, TS 38.212] is used;- indicated by the higher layer parameter *dmrs-SeqInitialization*, if present, for a Type 1 PUSCH transmission with a configured grant; - determined by the mapping between preamble(s) and a PUSCH occasion and the associated DMRS resource for a PUSCH transmission of Type-2 random access process in [5, TS 38.213];- otherwise $n\_{SCID}=0$.<Unchanged Text Omitted>---------------------- **Text proposal #4 ends for TS 38.211** ------------------------- |

Text proposal #2 for TS 38.213:

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| **Reasons for change**To correct the PUSCH occasion validation rule**Summary of changes**Implement the above update**Specs/Sections impacted**TS 38.213, Section 6.4.1.1.1.1----------------------**Text proposal #2 starts for TS 38.213** -----------------------8.1A PUSCH for Type-2 random access procedure<Unchanged Text Omitted>A PUSCH occasion is valid if it does not overlap in time and frequency with any valid contention based PRACH occasion associated with either a Type-1 random access procedure or a Type-2 random access procedure. Additionally, for unpaired spectrum and for SS/PBCH blocks with indexes provided by *ssb-PositionsInBurst* in *SIB1* or by *ServingCellConfigCommon* <Unchanged Text Omitted>---------------------- **Text proposal #5 ends for TS 38.213** -------------------------- |

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