**3GPP TSG-RAN WG1 Meeting #102-e *R1-200xxxx***

**e-Meeting, August 17th – 28th, 2020**

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| *CR-Form-v12.0* |
| **DRAFT CHANGE REQUEST** |
|  |
|  | **38.213** | **CR** |  | **rev** | **-** | **Current version:** | **16.2.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network | **X** | Core Network |  |

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| ***Title:***  | Draft CR on 2-step RACH for 38.213 |
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| ***Source to WG:*** | Moderator (ZTE) |
| ***Source to TSG:*** |  |
|  |  |
| ***Work item code:*** | NR\_2step\_RACH-Core |  | ***Date:*** | 2020-08-21 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-16 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)Rel-12 (Release 12)**Rel-13 (Release 13)Rel-14 (Release 14)Rel-15 (Release 15)Rel-16 (Release 16)* |
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| ***Reason for change:*** | The following updates and corrections are required:1. Align the RRC parameter names for 2-step RACH between the RAN1 specs and RRC spec in Clause 7.1.1 and 8.1 (TP#2 in [102-e-NR-2step-RACH-01])
2. Capture the missing condition in the description of subset RO sharing in Clauses 8.1 (TP#3 in [102-e-NR-2step-RACH-01])
3. Correct the description of TDRA for MsgA PUSCH in Clause 8.1A (TP#4 in [102-e-NR-2step-RACH-01])
4. Capture the missing default TDRA table 6.1.2.1.1-3 of extended CP for MsgA PUSCH in Clause 8.1A (TP#2 in [102-e-NR-2step-RACH-02])

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| ***Summary of change:*** | Implement the above updates and corrections. |
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| ***Consequences if not approved:*** | Incomplete/incorrect support for 2-step RACH. |
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| ***Clauses affected:*** | 7.1.1, 8.1, 8.1A |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 38.202, 38.211, 38.212, 38.214 |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
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| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

## 7.1.1 UE behavior

\*\*\* Unchanged text is omitted \*\*\*

- If a UE established dedicated RRC connection using a Type-2 random access procedure, as described in Clause 8, and is not provided *P0-PUSCH-AlphaSet*,or for a PUSCH transmission for Type-2 random access procedure as described in Clause 8.1A,

 $j=0$, $P\_{O\\_UE\\_PUSCH,b,f,c}(0)=0$, and $P\_{O\\_NOMINAL\\_PUSCH,f,c}(0)=P\_{O\\_PRE}+Δ\_{MsgA\\_PUSCH}$,

where $P\_{O\\_PRE}$ is provided by *msgA-preambleReceivedTargetPower*, or by *preambleReceivedTargetPower* if *msgA-preambleReceivedTargetPower* isnot provided, and $Δ\_{MsgA\\_PUSCH}$ is provided by *msgADeltaPreamble*, or $Δ\_{MsgA\\_PUSCH}=Δ\_{PREAMBLE\\_Msg3}$ dB if *msgADeltaPreamble* is not provided, for carrier $f$ of serving cell $c$

\*\*\* Unchanged text is omitted \*\*\*

## 8.1 Random access preamble

\*\*\* Unchanged text is omitted \*\*\*

For Type-2 random access procedure with common configuration of PRACH occasions with Type-1 random access procedure, a UE is provided a number $N$ of SS/PBCH block indexes associated with one PRACH occasion by *ssb-perRACH-OccasionAndCB-PreamblesPerSSB* and a number $Q$ of contention based preambles per SS/PBCH block index per valid PRACH occasion by  *msgA-CB-PreamblesPerSSB-PerSharedRO*. The PRACH transmission can be on a subset of PRACH occasions associated with a same SS/PBCH block index within an SSB-RO mapping cycle for a UE provided with a PRACH mask index by *msgA-SSB-SharedRO-MaskIndex* according to [11, TS 38.321].

For Type-2 random access procedure with separate configuration of PRACH occasions with Type-1 random access procedure, a UE is provided a number $N$ of SS/PBCH block indexes associated with one PRACH occasion and a number $R$ of contention based preambles per SS/PBCH block index per valid PRACH occasion by *msgA-SSB-PerRACH-OccasionAndCB-PreamblesPerSSB* when provided; otherwise, by *ssb-perRACH-OccasionAndCB-PreamblesPerSSB*.

For Type-1 random access procedure, or for Type-2 random access procedure with separate configuration of PRACH occasions from Type 1 random access procedure, if $N<1$, one SS/PBCH block index is mapped to ${1}/{N}$ consecutive valid PRACH occasions and $R$ contention based preambles with consecutive indexes associated with the SS/PBCH block index per valid PRACH occasion start from preamble index 0. If $N\geq 1$, $R$ contention based preambles with consecutive indexes associated with SS/PBCH block index $n$, $0\leq n\leq N-1$, per valid PRACH occasion start from preamble index $n{⋅N\_{preamble}^{total}}/{N}$ where $N\_{preamble}^{total}$ is provided by *totalNumberOfRA-Preambles* for Type-1 random access procedure, or by *msgA-TotalNumberOfRA-Preambles* for Type-2 random access procedure with separate configuration of PRACH occasions from a Type 1 random access procedure, and is an integer multiple of $N$.

\*\*\* Unchanged text is 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*.

\*\*\* Unchanged text is omitted \*\*\*

Consecutive PUSCH occasions within each slot are separated by *guardPeriodMsgA-PUSCH* symbols and have same duration. A number $N\_{t}$ of time domain PUSCH occasions in each slot is provided by *nrofMsgA-PO-perSlot* and a number $N\_{s}$ of consecutive slots that include PUSCH occasions is provided by *nrofSlotsMsgA-PUSCH*.

A UE is provided a DMRS configuration for a PUSCH transmission in a PUSCH occasion in an active UL BWP by *msgA-DMRS-Config*.

\*\*\* Unchanged text is omitted \*\*\*

A PUSCH occasion for PUSCH transmission is defined by a frequency resource and a time resource, and is associated with a DMRS resource. The DMRS resources are provided by  *msgA-DMRS-Config*.

\*\*\* Unchanged text is omitted \*\*\*

where $N\_{preamble}=ceil\left({T\_{preamble}}/{T\_{PUSCH}}\right)$, $T\_{preamble}$ is a total number of valid PRACH occasions per association pattern period multiplied by the number of preambles per valid PRACH occasion provided by *rach-ConfigCommonTwoStepRA*, and $T\_{PUSCH}$ is a total number of valid PUSCH occasions per PUSCH configuration per association pattern period multiplied by the number of DMRS resource indexes per valid PUSCH occasion provided by *msgA-DMRS-Config*.

\*\*\* Unchanged text is omitted \*\*\*

## 8.1A PUSCH for Type-2 random access procedure

\*\*\* Unchanged text is omitted \*\*\*

If a UE does not have dedicated RRC configuration, or has an initial UL BWP as an active UL BWP, or is not provided *startSymbolAndLengthMsgA-PO*, *msgA-PUSCH-timeDomainAllocation* provides a SLIV and a PUSCH mapping type for a PUSCH transmission by indicating

- one of the first *maxNrofUL-Allocations* values from *PUSCH-TimeDomainResourceAllocationList*, if *PUSCH-TimeDomainResourceAllocationList* is provided in *PUSCH-ConfigCommon*

- one of the entries from table 6.1.2.1.1-2 or table 6.1.2.1.1-3 in [6, TS 38.214], if *PUSCH-TimeDomainResourceAllocationList* is not provided in *PUSCH-ConfigCommon*

else, the UE is provided a SLIV by *startSymbolAndLengthMsgA-PO*, and a PUSCH mapping type by *mappingTypeMsgA-PUSCH* for a PUSCH transmission.

For mapping one or multiple preambles of a PRACH slot to a PUSCH occasion associated with a DMRS resource, a UE determines a first slot for a first PUSCH occasion in an active UL BWP from *msgA-PUSCH-TimeDomainOffset* that provides an offset, in number of slots in the active UL BWP, relative to the start of a PUSCH slot including the start of each PRACH slot. The UE does not expect to have a PRACH preamble transmission and a PUSCH transmission with a msgA in a PRACH slot or in a PUSCH slot, or to have overlapping msgA PUSCH occasions for a MsgA PUSCH configuration. The UE expects that a first PUSCH occasion in each slot has a same SLIV for a PUSCH transmission that is provided by *startSymbolAndLengthMsgA-PO* or *msgA-PUSCH-timeDomainAllocation* [6, TS 38.214].

\*\*\* Unchanged text is omitted \*\*\*