**3GPP TSG-RAN WG2 Meeting #130 R2-2504846**

**Malta, May 19th – 23th, 2025**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.331** | **CR** | **-** | **rev** | **-** | **Current version:** | **18.5.1** |  |
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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:*** | Correction on rsrp-ThresholdSSB-r17 in TS 38.331(R18) | | | | | | | | | |
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| ***Source to WG:*** | Huawei, HiSilicon, Qualcomm, MediaTek, ZTE, Xiaomi, Vivo, Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R2 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_redcap-Core, NR\_cov\_enh-Core, NR\_Slice-Core, NR\_SmallData\_INACTIVE-Core | | | | |  | ***Date:*** | | | 2025-05-21 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **A** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *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 can be 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-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | RAN2 made the following agreement for *rsrp-ThresholdSSB.*  RAN2 will clarify in the spec that for 4-step Case 2 and case 3 (Rel-17):  • If the rsrp-ThresholdSSB-r17 is absent in FeatureCombinationPreambles included in rach-ConfigCommon(without suffix) or rach-ConfigCommon-r17, the UE shall apply the corresponding parameter (i.e. rsrp-ThresholdSSB without suffix) included in the RACH-ConfigCommon which includes the FeatureCombinationPreambles.  • Furthermore, if the rsrp-ThresholdSSB-r17 is absent in FeatureCombinationPreambles and the rsrp-ThresholdSSB (without suffix) is absent in the RACH-ConfigCommon which includes the FeatureCombinationPreambles, the UE shall not apply any threshold for SSB selection in the 4-step RA procedure, i.e. NO parameter selection fallback from the rach-ConfigCommon-r17 in AdditionalRACH-Config-r17 to rach-ConfigCommon (without suffix).  RAN2 to clarify in the spec that for 2-step Case 5 (Rel-17):  - If the rsrp-ThresholdSSB-r17 (i.e. msgA-RSRP-ThresholdSSB for 2-step RA procedure) is absent in FeatureCombinationPreambles-r17 included in msgA-ConfigCommon-r16 or msgA-ConfigCommon-r17 the UE shall apply the msgA-RSRP-ThresholdSSB-r16 if included in the msgA-ConfigCommon-r16 or msgA-ConfigCommon-r17 including the FeatureCombinationPreambles-r17 | | | | | | | | |
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| ***Summary of change:*** | | Adding the clarification in the field description of *rsrp-ThresholdSSB-r17* to clarify the UE behavior when the field is not included in *FeatureCombinationPreambles*.  **Impact analysis**  Impacted 5G architecture options:  NR SA, NR-DC, (NG)EN-DC, NE-DC  Impacted functionality:  RACH partitioning  Inter-operability:  If the UE is implemented according to this CR but the network is not, there is no inter-operability issue.  If the network is implemented according to this CR but the UE is not, the UE may not use the desired parameter for the RACH procedure and may lead to misunderstanding between the UE and the network. | | | | | | | | |
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| ***Consequences if not approved:*** | | The UE behavior is unclear when the *rsrp-ThresholdSSB-r17* is absent in *FeatureCombinationPreambles-r17*. The UE cannot know which parameter should be referred to which may lead to misunderstanding between the UE and the network. | | | | | | | | |
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| ***Clauses affected:*** | | 6.3.2 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **x** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **x** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **x** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | |  | | | | | | | | |

Start of Change

### 6.3.2 Radio resource control information elements

<Omitted texts>

– *FeatureCombinationPreambles*

The IE *FeatureCombinationPreambles* associatesa set of preambles with a feature combination. For parameters which can be provided in this IE, the UE applies this field value when performing Random Access using a preamble in this featureCombinationPreambles, otherwise the UE applies the corresponding value as determined by applicable Need Code, e.g. Need S. On a specific BWP, there can be at most one set of preambles associated with a given feature combination per RA Type (i.e. 4-step RACH or 2-step RACH) per MSG1 repetition number.

***FeatureCombinationPreambles* information element**

-- ASN1START

-- TAG-FEATURECOMBINATIONPREAMBLES-START

FeatureCombinationPreambles-r17 ::= SEQUENCE {

featureCombination-r17 FeatureCombination-r17,

startPreambleForThisPartition-r17 INTEGER (0..63),

numberOfPreamblesPerSSB-ForThisPartition-r17 INTEGER (1..64),

ssb-SharedRO-MaskIndex-r17 INTEGER (1..15) OPTIONAL, -- Need S

groupBconfigured-r17 SEQUENCE {

ra-SizeGroupA-r17 ENUMERATED {b56, b144, b208, b256, b282, b480, b640,

b800, b1000, b72, spare6, spare5,spare4, spare3, spare2, spare1},

messagePowerOffsetGroupB-r17 ENUMERATED { minusinfinity, dB0, dB5, dB8, dB10, dB12, dB15, dB18},

numberOfRA-PreamblesGroupA-r17 INTEGER (1..64)

} OPTIONAL, -- Need R

separateMsgA-PUSCH-Config-r17 MsgA-PUSCH-Config-r16 OPTIONAL, -- Cond MsgAConfigCommon

msgA-RSRP-Threshold-r17 RSRP-Range OPTIONAL, -- Need R

rsrp-ThresholdSSB-r17 RSRP-Range OPTIONAL, -- Need R

deltaPreamble-r17 INTEGER (-1..6) OPTIONAL, -- Need R

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[[

msg1-RepetitionNum-r18 ENUMERATED {n2, n4, n8, spare1} OPTIONAL, -- Cond Msg1Rep2

msg1-RepetitionTimeOffsetROGroup-r18 ENUMERATED {n4, n8, n16, spare1} OPTIONAL -- Cond Msg1Rep3

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}

-- TAG-FEATURECOMBINATIONPREAMBLES-STOP

-- ASN1STOP

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| ***FeatureCombinationPreambles* field descriptions** |
| ***deltaPreamble***  Power offset between msg3 or msgA-PUSCH and RACH preamble transmission. If configured, this parameter overrides *msg3-DeltaPreamble* or *msgA-DeltaPreamble*, Actual value = field value \* 2 [dB] (see TS 38.213 [13], clause 7.1). If *msgA-DeltaPreamble* is configured in *separateMsgA-PUSCH-Config-r17*, this field is absent. This field is set to the same value for all *FeatureCombinationPreambles* for MSG1 repetitions. |
| ***featureCombination***  Indicates which combination of features that the preambles indicated by this IE are associated with. Network ensures that at least one field within the *featureCombination* is configured. The UE ignores a RACH resource defined by this *FeatureCombinationPreambles* if any feature within the *featureCombination* is not supported by the UE or if any of the spare fields within the *featureCombination* is set to *true*. |
| ***messagePowerOffsetGroupB***  Threshold for preamble selection. Value is in dB. Value *minusinfinity* corresponds to –infinity. Value *dB0* corresponds to 0 dB, *dB5* corresponds to 5 dB and so on (see TS 38.321 [3], clause 5.1.2). |
| ***msg1-RepetitionNum***  Indicates which MSG1-repetition number that this *FeatureCombinationPreambles* is associated with. |
| ***msg1-RepetitionTimeOffsetROGroup***  Indicates a time offset of the starting ROs between two successive RO groups for a given repetition number (2, 4 or 8) associated with this *FeatureCombinationPreambles* for each frequency resource index within a time period (see TS 38.213 [13]). If this field is absent, the time offset is implicitly determined (see TS 38.213 [13]).  For each MSG1 repetition number, the following values are applicable.  • {n16}, for RO groups for MSG1 repetition number 8  • {n8, n16}, for RO groups for MSG1 repetition number 4  • {n4, n8, n16}, for RO groups for MSG1 repetition number 2 |
| ***msgA-RSRP-Threshold***  The UE selects 2-step random access type to perform random access based on this threshold (see TS 38.321 [3], clause 5.1.1). This field is only present if both 2-step and 4-step RA type are configured for the concerned feature combination in the BWP. If configured, this parameter overrides *msgA-RSRP-Threshold-r16*. If absent, the UE applies *msgA-RSRP-Threshold-r16*, if configured |
| ***numberOfPreamblesPerSSB-ForThisPartition***  It determines how many consecutive preambles are associated to the Feature Combination starting from the starting preamble(s) per SSB. |
| ***numberOfRA-PreamblesGroupA***  It determines how many consecutive preambles per SSB are associated to Group A starting from the starting preamble(s). The remaining preambles associated to the Feature Combination are associated to Group B |
| ***ra-SizeGroupA***  Transport Blocks size threshold in bits below which the UE shall use a contention-based RA preamble of group A. (see TS 38.321 [3], clause 5.1.2). If this feature combination preambles are associated to a *RACH-ConfigCommon-twostepRA*, this field correspond to *ra-MsgA-SizeGroupA*, otherwise it corresponds to *ra-Msg3SizeGroupA*. |
| ***rsrp-ThresholdSSB***  UE may select the SS block and corresponding PRACH resource for path-loss estimation and (re)transmission based on SS blocks that satisfy the threshold (see TS 38.213 [13]). If this parameter is included in *FeatureCombinationPreambles* which is included in *RACH-ConfigCommonTwoStepRA*, it corresponds to *msgA-RSRP-ThresholdSSB*, as defined in TS 38.321 [3]. If this parameter is included in *FeatureCombinationPreambles* which is included in *RACH-ConfigCommon*, it it corresponds to *rsrp-ThresholdSSB*, as defined in TS 38.321 [3]. If this parameter is not included in *FeatureCombinationPreambles* which is included in *RACH-ConfigCommon*, the UE applies *rsrp-ThresholdSSB* included in the *RACH-ConfigCommon* which includes the *FeatureCombinationPreambles*. If this parameter is not included in *FeatureCombinationPreambles* which is included in *RACH-ConfigCommonTwoStepRA*, the UE applies *msgA-RSRP-ThresholdSSB* included in the *RACH-ConfigCommonTwoStepRA* which includes the *FeatureCombinationPreambles*. |
| ***separateMsgA-PUSCH-Config***  If present, it specifies how the 2-step RACH preambles identified by this *FeatureCombinationPreambles* are mapped to a PUSCH slot separate from the one defined in MsgA-ConfigCommon-r16. If the field is absent, the UE should apply the corresponding parameter in the *RACH-ConfigCommonTwoStepRA* of the BWP which includes the *FeatureCombinationPreambles IE*. |
| ***ssb-SharedRO-MaskIndex***  Mask index (see TS 38.321 [3]).  Indicates a subset of ROs where preambles are allocated for this feature combination.  If this field is configured within *FeatureCombinationPreambles* which is included in *RACH-ConfigCommonTwoStepRA*:  - in case of separate ROs are configured for 4-step and 2-step random access, this field indicates a subset of ROs configured within this *RACH-ConfigCommonTwoStepRA*;  - in case shared ROs are used for 4-step and 2-step random access, it indicates the subset of ROs configured within *RACH-ConfigCommon*, which are the subset of ROs configured for 2-step random access.  This field is configured when there is more than one RO per SSB. If the field is absent, all ROs configured in *RACH-ConfigCommon* or *RACH-ConfigCommonTwoStepRA* containing this *FeatureCombinationPreambles* are shared. The network does not configure this field, if the field *msg1-RepetitionNum* is configured. |
| ***startPreambleForThisPartition***  It defines the first preamble associated with the Feature Combination. If the UE is provided with a number N of SSB block indexes associated with one PRACH occasion, and N<1, the first preamble in each PRACH occasion is the one having the same index as indicated by this field. If N>=1, N blocks of preambles associated with the Feature Combination are defined, each having start index + *startPreambleForThisPartition*, where n refers to SSB block index (see TS 38.213 [13], clause 8.1). |

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| **Conditional Presence** | **Explanation** |
| *MsgAConfigCommon* | The field is optionally present, Need S, if *FeatureCombinationPreambles* is included in *RACH-ConfigCommonTwoStepRA*. Otherwise, it is absent. If the field is absent in *FeatureCombinationPreambles* included in *RACH-ConfigCommonTwoStepRA*, the UE applies *MsgA-PUSCH-Config* included in the corresponding *MsgA-ConfigCommon*. |
| *Msg1Rep2* | The field is mandatory present, if *msg1-Repetitions* is included in *FeatureCombination* for this concerned *FeatureCombinationPreambles*. Otherwise, it is absent. |
| *Msg1Rep3* | The field is optionally present, Need S, if *msg1-Repetitions* is included in *FeatureCombination* for this concerned *FeatureCombinationPreambles*. Otherwise, it is absent. |