**3GPP TSG-RAN WG2 Meeting #119eR2-2209031**

**eMeeting, 17th – 26th August, 2022**

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| *CR-Form-v12.0* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **3471** | **rev** | **-** | **Current version:** | **17.1.0** |  |
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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:***  | Correction on measurement gap enhancement configurations |
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| ***Source to WG:*** | MediaTek Inc. |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_MG\_enh-Core |  | ***Date:*** | 2022/08/17 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***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 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)* |
|  |  |
| ***Reason for change:*** | For MGE, RAN2 added new R17 field *gapToAddModList* for new MGE features. It is understood that NW will only use this field for Rel-17 UE that supports any of MGE features. It is suggested to clarify this in the SPEC.For *mgta* configuration of NCSG, RAN2 understands from latest RAN4 agreed CR that: * For per-UE or FR1 NCSG, only 0ms mgta is used
* For FR2 NCSG, only 0ms and 0.75ms mgta is used
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| ***Summary of change:*** | <1>Add the following clarification in 38.331 field *gapToAddModList*• This field is used only for a UE that supports pre-configured measurement gap, concurrent measurement gap, or NCSG. <2> Clarify that the network only configures 0ms mgta for per-UE NCSG and FR1 NCSG and only configures 0ms or 0.75ms for FR2 NCSG..<3> Some editorial change, fix Typo, use correct reference RAN4 clauses or RAN4 Table**Impact analysis**Impacted 5G architecture options: StandaloneImpacted functionality: Measurement gap enhancement features (concurrent gap, NCSG, pre-configured MG)Inter-operability:If the network is implemented according to this CR while the UE is not, there is no inter-operability issue. If the UE is implemented according to this CR while the network is not, there may be inter-operability issue. The NW may provide some unsupported configuration and the UE will reject the RRC Reconfiguration and trigger reestablishment. |
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| ***Consequences if not approved:*** | Whether *gapToAddModList-r17* could be used for all Rel-17 UE is unclear. The *mgta* configuration limitation is not aligned with RAN4. |
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| ***Clauses affected:*** | 6.3.2 |
|  |  |
|  | **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:*** |  |

### 6.3.2 Radio resource control information elements

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– *MeasGapConfig*

The IE *MeasGapConfig* specifies the measurement gap configuration and controls setup/release of measurement gaps.

***MeasGapConfig* information element**

-- ASN1START

-- TAG-MEASGAPCONFIG-START

MeasGapConfig ::= SEQUENCE {

 gapFR2 SetupRelease { GapConfig } OPTIONAL, -- Need M

 ...,

 [[

 gapFR1 SetupRelease { GapConfig } OPTIONAL, -- Need M

 gapUE SetupRelease { GapConfig } OPTIONAL -- Need M

 ]],

 [[

 gapToAddModList-r17 SEQUENCE (SIZE (1..maxNrofGapId-r17)) OF GapConfig-r17 OPTIONAL, -- Need N

 gapToReleaseList-r17 SEQUENCE (SIZE (1..maxNrofGapId-r17)) OF MeasGapId-r17 OPTIONAL, -- Need N

 posMeasGapPreConfigToAddModList-r17 PosMeasGapPreConfigToAddModList-r17 OPTIONAL, -- Need N

 posMeasGapPreConfigToReleaseList-r17 PosMeasGapPreConfigToReleaseList-r17 OPTIONAL -- Need N

 ]]

}

GapConfig ::= SEQUENCE {

 gapOffset INTEGER (0..159),

 mgl ENUMERATED {ms1dot5, ms3, ms3dot5, ms4, ms5dot5, ms6},

 mgrp ENUMERATED {ms20, ms40, ms80, ms160},

 mgta ENUMERATED {ms0, ms0dot25, ms0dot5},

 ...,

 [[

 refServCellIndicator ENUMERATED {pCell, pSCell, mcg-FR2} OPTIONAL -- Cond NEDCorNRDC

 ]],

 [[

 refFR2ServCellAsyncCA-r16 ServCellIndex OPTIONAL, -- Cond AsyncCA

 mgl-r16 ENUMERATED {ms10, ms20} OPTIONAL -- Cond PRS

 ]]

}

GapConfig-r17 ::= SEQUENCE {

 measGapId-r17 MeasGapId-r17,

 gapType-r17 ENUMERATED {perUE, perFR1, perFR2},

 gapOffset-r17 INTEGER (0..159),

 mgl-r17 ENUMERATED {ms1, ms1dot5, ms2, ms3, ms3dot5, ms4, ms5, ms5dot5, ms6, ms10, ms20},

 mgrp-r17 ENUMERATED {ms20, ms40, ms80, ms160},

 mgta-r17 ENUMERATED {ms0, ms0dot25, ms0dot5, ms0dot75},

 refServCellIndicator-r17 ENUMERATED {pCell, pSCell, mcg-FR2} OPTIONAL, -- Cond NEDCorNRDC

 refFR2-ServCellAsyncCA-r17 ServCellIndex OPTIONAL, -- Cond AsyncCA

 preConfigInd-r17 ENUMERATED {true} OPTIONAL, -- Need R

 ncsgInd-r17 ENUMERATED {true} OPTIONAL, -- Need R

 gapAssociationPRS-r17 ENUMERATED {true} OPTIONAL, -- Need R

 gapSharing-r17 MeasGapSharingScheme OPTIONAL, -- Need R

 gapPriority-r17 GapPriority-r17 OPTIONAL, -- Need R

 ...

}

PosMeasGapPreConfigToAddModList-r17 ::= SEQUENCE (SIZE (1..maxNrofPreConfigPosGapId-r17)) OF PosGapConfig-r17

PosMeasGapPreConfigToReleaseList-r17 ::= SEQUENCE (SIZE (1..maxNrofPreConfigPosGapId-r17)) OF MeasPosPreConfigGapId-r17

PosGapConfig-r17 ::= SEQUENCE {

 measPosPreConfigGapId-r17 MeasPosPreConfigGapId-r17,

 gapOffset-r17 INTEGER (0..159),

 mgl-r17 ENUMERATED {ms1dot5, ms3, ms3dot5, ms4, ms5dot5, ms6, ms10, ms20},

 mgrp-r17 ENUMERATED {ms20, ms40, ms80, ms160},

 mgta-r17 ENUMERATED {ms0, ms0dot25, ms0dot5},

 gapType-r17 ENUMERATED {perUE, perFR1, perFR2},

 ...

}

MeasPosPreConfigGapId-r17 ::= INTEGER (1..maxNrofPreConfigPosGapId-r17)

-- TAG-MEASGAPCONFIG-STOP

-- ASN1STOP

| ***MeasGapConfig* field descriptions** |
| --- |
| ***gapAssociationPRS***Indicates that PRS measurement is associated with this measurement gap. The network only includes this field for one per UE gap. If concurrent gap (i.e. one of the gap combination as defined in Table 9.1.8-1 in TS 38.133 [14]) is configured and no gap is configured with this field, the PRS measurement is associated with the gap configured via *gapUE*, if available. |
| ***gapFR1***Indicates measurement gap configuration that applies to FR1 only. In (NG)EN-DC, *gapFR1* cannot be set up by NR RRC (i.e. only LTE RRC can configure FR1 measurement gap). In NE-DC, *gapFR1* can only be set up by NR RRC (i.e. LTE RRC cannot configure FR1 gap). In NR-DC, *gapFR1* can only be set up in the *measConfig* associated with MCG. *gapFR1* can not be configured together with *gapUE*. The applicability of the FR1 measurement gap is according to Table 9.1.2-2 and Table 9.1.2-3 in TS 38.133 [14]. |
| ***gapFR2***Indicates measurement gap configuration applies to FR2 only. In (NG)EN-DC or NE-DC, *gapFR2* can only be set up by NR RRC (i.e. LTE RRC cannot configure FR2 gap). In NR-DC, *gapFR2* can only be set up in the *measConfig* associated with MCG. *gapFR2* cannot be configured together with *gapUE*. The applicability of the FR2 measurement gap is according to Table 9.1.2-2 and Table 9.1.2-3 in TS 38.133 [14]. |
| ***gapOffset***Value *gapOffset* is the gap offset of the gap pattern with MGRP indicated in the field *mgrp*. The value range is from 0 to *mgrp*-1. If *ncsgInd-r17* is present, this offset value refers to the starting point of VIL1 (the visible interruption length before the ML). |
| ***gapPriority***Indicates the priority of this measurement gap (see TS 38.133 [14], clause FFS). *Value 1* indicates highest priority, *value* 2 indicates second level priority, and so on. |
| ***gapSharing***Indicates the measurement gap sharing scheme that applies to this *GapConfig*. For applicability of the different gap sharing schemes, see TS 38.133 [14]. Value *scheme00* corresponds to scheme "00", value *scheme01* corresponds to scheme "01", and so on. |
| ***gapToAddModList***A list of of measurement gap configuration to be added or modified. If more than one measurement gap is configured (i.e. concurrent measurement gap as specified in TS 38.133[14], clause 9.1.8), the maximum number of configured measurement gap is limited by the gap combinations defined in Table 9.1.8-1 in TS 38.133 [14]. The network configures at most one NCSG or pre-configured measurement gap for a given gap type. In this version of the specification, the network configures this field only in NR standalone. This field is used only for a UE that supports pre-configured measurement gap, concurrent measurement gap, or NCSG. |
| ***gapToReleaseList***A list of measurement gap configuration to be released. |
| ***gapType***Indicates the type of this measurement gap. Value *perUE* indicates that it is a per UE measurement gap, value *perFR1* indicates that it is an FR1 measurement gap, and value *perFR2* indicates that it is an FR2 measurement gap. |
| ***gapUE***Indicates measurement gap configuration that applies to all frequencies (FR1 and FR2). In (NG)EN-DC, *gapUE* cannot be set up by NR RRC (i.e. only LTE RRC can configure per UE measurement gap). In NE-DC, *gapUE* can only be set up by NR RRC (i.e. LTE RRC cannot configure per UE gap). In NR-DC, *gapUE* can only be set up in the *measConfig* associated with MCG. If *gapUE* is configured, then neither *gapFR1* nor *gapFR2* can be configured. The applicability of the per UE measurement gap is according to Table 9.1.2-2 and Table 9.1.2-3 in TS 38.133 [14]. |
| ***measGapId***The ID of this measurement gap configuration. |
| ***mgl***Value *mgl* is the measurement gap length in ms of the measurement gap. If *ncsgInd-r17* is not present, the measurement gap length is according to in Table 9.1.2-1 in TS 38.133 [14]. If *ncsgInd-r17* is present, this field indicates the measurement length (ML) in NCSG pattern and is configured according to Table 9.1.9.3-1 in TS 38.133 [14]. Value *ms1dot5* corresponds to 1.5 ms, *ms3* corresponds to 3 ms and so on. If *mgl-r16* is present, UE shall ignore the *mgl* (without suffix). Value *ms1*, *ms2*, and *ms5* can only be configured if *ncsgInd* is present. |
| ***mgrp***Value *mgrp* is measurement gap repetition period in (ms) of the measurement gap. The measurement gap repetition period is according to Table 9.1.2-1 in TS 38.133 [14]. |
| ***mgta***Value *mgta* is the measurement gap timing advance in ms. The applicability of the measurement gap timing advance is according to clause 9.1.2 of TS 38.133 [14], or according to clause 9.1.9 of TS 38.133 [14] if *ncsgInd* is present. Value *ms0* corresponds to 0 ms, *ms0dot25* corresponds to 0.25 ms, *ms0dot5* corresponds to 0.5 ms and *ms0dot75* corresponds to 0.75 ms. For FR2, the network only configures 0 ms and 0.25 ms if *ncsgInd* is not present. If *ncsgInd* is present, the network only configures 0ms for per-UE NCSG and FR1 NCSG and only configures 0ms or 0.75ms for FR2 NCSG. Value *ms0dot75* can only be configured if *ncsgInd* is present. |
| ***ncsgInd***Indicates that the measurement gap is a NCSG as specified in 38.133 [14]. |
| ***posMeasGapPreConfigToAddModList***List of preconfigured measurement gap for positioning to add and/or modify. All the gaps configured are associated with the measurement of PRS for RSTD, UE-RxTx Time Difference, PRS-RSRP and PRS-RSRPP as defined in TS 38.215 [9]. |
| ***posMeasGapPreConfigToReleasList***List of preconfigured measurement gap for positioning to release. |
| ***preConfigInd***Indicates whether the measurement gap is a pre-configured measurement gap. |
| ***refFR2ServCellAsyncCA***Indicates the FR2 serving cell identifier whose SFN and subframe is used for FR2 gap calculation for this gap pattern with asynchronous CA involving FR2 carrier(s). |
| ***refServCellIndicator***Indicates the serving cell whose SFN and subframe are used for gap calculation for this gap pattern. Value pCell corresponds to the PCell, pSCell corresponds to the PSCell, and mcg-FR2 corresponds to a serving cell on FR2 frequency in MCG. |

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| **Conditional Presence** | **Explanation** |
| *AsyncCA* | This field is mandatory present when configuring FR2 gap pattern to UE in:- (NG)EN-DC or NR SA with asynchronous CA involving FR2 carrier(s);- NE-DC or NR-DC with asynchronous CA involving FR2 carrier(s), if the field *refServCellIndicator* is set to *mcg-FR2*.In case the gap pattern to UE in NE-DC and NR-DC is already configured and the serving cell used for the gap calculation corresponds to a serving cell on FR2 frequency in MCG, then the field is optionally present, need M. Otherwise, it is absent, Need R. |
| *NEDCorNRDC* | This field is mandatory present when configuring gap pattern to UE in NE-DC or NR-DC. In case the gap pattern to UE in NE-DC and NR-DC is already configured, then the field is absent, need M. Otherwise, it is absent. |
| *PRS* | This field is optionally present, Need R, when configuring gap pattern to UE for measurements of DL-PRS configured via LPP (TS 37.355 [49]). Otherwise, it is absent. |