**3GPP TSG- Meeting # *DocNumber***

**, 2022-08-17 - 2022-08-29**

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| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **CRNum** | **rev** | **-**  | **Current version:** | **17.1.0** |  |
|  |
| *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:***  | Optional drx-HARQ-RTT-TimerUL start after last repetition, RRC changes |
|  |  |
| ***Source to WG:*** | Ericsson,  |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | TEI17  |  | ***Date:*** | 2022-08-27 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | This CR introduces an optional start of the drx-HARQ-RTT-TimerUL in the first symbol after the last transmission (within a bundle) as compared to start it after the end of the first transmission (within a bundle). This enables power savings when the repetition factor is controlled via the DCI. |
|  |  |
| ***Summary of change:*** | Section 6.3.2A new optional field of Mac-CellGroupConfig is introduced. Section 6.3.3Signalling for the new UE capability lastTransmisssion-r17 is added. **Impact analysis**Impacted functionality:DRX feature.Inter-operability:If the UE is implemented according to this CR and the network is not, there is no inter-operability issue.If the network is implemented according to this CR, and the UE is not, there is no inter-operability issue. |
|  |  |
| ***Consequences if not approved:*** | The UE energy consumption will be higher than necessary when bundling is controlled by DCI.  |
|  |  |
| ***Clauses affected:*** | 6.3.2, 6.3.3 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 38.321 CRzzzz, TS 38.306 CRyyyy |
| ***affected:*** |  |  |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  |  |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** |  |
|  |  |
| ***This CR's revision history:*** |  |

*START OF CHANGE*

### 6.3.2 Radio resource control information elements

<<< UNCHANGED PARTS OMITTED >>>

– *MAC-CellGroupConfig*

The IE *MAC-CellGroupConfig* is used to configure MAC parameters for a cell group, including DRX.

***MAC-CellGroupConfig* information element**

-- ASN1START

-- TAG-MAC-CELLGROUPCONFIG-START

MAC-CellGroupConfig ::= SEQUENCE {

 drx-Config SetupRelease { DRX-Config } OPTIONAL, -- Need M

 schedulingRequestConfig SchedulingRequestConfig OPTIONAL, -- Need M

 bsr-Config BSR-Config OPTIONAL, -- Need M

 tag-Config TAG-Config OPTIONAL, -- Need M

 phr-Config SetupRelease { PHR-Config } OPTIONAL, -- Need M

 skipUplinkTxDynamic BOOLEAN,

 ...,

 [[

 csi-Mask BOOLEAN OPTIONAL, -- Need M

 dataInactivityTimer SetupRelease { DataInactivityTimer } OPTIONAL -- Cond MCG-Only

 ]],

 [[

 usePreBSR-r16 ENUMERATED {true} OPTIONAL, -- Need R

 schedulingRequestID-LBT-SCell-r16 SchedulingRequestId OPTIONAL, -- Need R

 lch-BasedPrioritization-r16 ENUMERATED {enabled} OPTIONAL, -- Need R

 schedulingRequestID-BFR-SCell-r16 SchedulingRequestId OPTIONAL, -- Need R

 drx-ConfigSecondaryGroup-r16 SetupRelease { DRX-ConfigSecondaryGroup } OPTIONAL -- Need M

 ]],

 [[

 enhancedSkipUplinkTxDynamic-r16 ENUMERATED {true} OPTIONAL, -- Need R

 enhancedSkipUplinkTxConfigured-r16 ENUMERATED {true} OPTIONAL -- Need R

 ]],

 [[

 intraCG-Prioritization-r17 ENUMERATED {enabled} OPTIONAL, -- Cond LCH-PrioWithReTxTimer

 drx-ConfigSL-r17 SetupRelease { DRX-ConfigSL-r17 } OPTIONAL, -- Need M

 drx-ConfigExt-v1700 SetupRelease { DRX-ConfigExt-v1700 } OPTIONAL, -- Need M

 schedulingRequestID-BFR-r17 SchedulingRequestId OPTIONAL, -- Need R

 schedulingRequestID-BFR2-r17 SchedulingRequestId OPTIONAL, -- Need R

 schedulingRequestConfig-v1700 SchedulingRequestConfig-v1700 OPTIONAL, -- Need M

 tar-Config-r17 SetupRelease { TAR-Config-r17 } OPTIONAL, -- Need M

 g-RNTI-ConfigToAddModList-r17 SEQUENCE (SIZE (1..maxG-RNTI-r17)) OF MBS-RNTI-SpecificConfig-r17 OPTIONAL, -- Need N

 g-RNTI-ConfigToReleaseList-r17 SEQUENCE (SIZE (1..maxG-RNTI-r17)) OF MBS-RNTI-SpecificConfigId-r17 OPTIONAL, -- Need N

 g-CS-RNTI-ConfigToAddModList-r17 SEQUENCE (SIZE (1..maxG-CS-RNTI-r17)) OF MBS-RNTI-SpecificConfig-r17 OPTIONAL, -- Need N

 g-CS-RNTI-ConfigToReleaseList-r17 SEQUENCE (SIZE (1..maxG-CS-RNTI-r17)) OF MBS-RNTI-SpecificConfigId-r17 OPTIONAL, -- Need N

 allowCSI-SRS-Tx-MulticastDRX-Active-r17 BOOLEAN OPTIONAL -- Need M

 ]],

 [[

 drx-LastTransmissionUL-r17 ENUMERATED {enabled} OPTIONAL -- Need R

 ]]

}

DataInactivityTimer ::= ENUMERATED {s1, s2, s3, s5, s7, s10, s15, s20, s40, s50, s60, s80, s100, s120, s150, s180}

MBS-RNTI-SpecificConfig-r17 ::= SEQUENCE {

 mbs-RNTI-SpecificConfigId-r17 MBS-RNTI-SpecificConfigId-r17,

 groupCommon-RNTI-r17 CHOICE {

 g-RNTI RNTI-Value,

 g-CS-RNTI RNTI-Value

 },

 drx-ConfigPTM-r17 SetupRelease { DRX-ConfigPTM-r17 } OPTIONAL, -- Need M

 harq-FeedbackEnablerMulticast-r17 ENUMERATED {dci-enabler, enabled} OPTIONAL, -- Need S

 harq-FeedbackOptionMulticast-r17 ENUMERATED {ack-nack, nack-only} OPTIONAL, -- Cond HARQFeedback

 pdsch-AggregationFactorMulticast-r17 ENUMERATED {n2, n4, n8} OPTIONAL -- Cond G-RNTI

}

MBS-RNTI-SpecificConfigId-r17 ::= INTEGER (0..maxG-RNTI-1-r17)

-- TAG-MAC-CELLGROUPCONFIG-STOP

-- ASN1STOP

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| --- |
| ***MAC-CellGroupConfig* field descriptions** |
| ***allowCSI-SRS-Tx-MulticastDRX-Active***Used to control the CSI/SRS transmission during MBS multicast DRX ActiveTime, see TS 38.321 [3]. |
| ***csi-Mask***If set to true, the UE limits CSI reports to the on-duration period of the DRX cycle, see TS 38.321 [3]. |
| ***dataInactivityTimer***Releases the RRC connection upon data inactivity as specified in clause 5.3.8.5 and in TS 38.321 [3]. Value *s1* corresponds to 1 second, value s2 corresponds to 2 seconds, and so on. |
| ***drx-Config, drx-ConfigExt***Used to configure DRX as specified in TS 38.321 [3]. Network only configures *drx-ConfigExt* when *drx-Config* is configured. |
| ***drx-ConfigSecondaryGroup***Used to configure DRX related parameters for the second DRX group as specified in TS 38.321 [3]. The network does not configure secondary DRX group with DCP simultaneously nor secondary DRX group with a dormant BWP simultaneously. |
| ***drx-ConfigSL***Used to configure additional DRX parameters for the UE performing sidelink operation with resource allocation mode 1, as specified in TS 38.321 [3]. Network only configures this field if *sl-ScheduledConfig* is configured and *drx-Config* is configured |
| ***drx-LastTransmissionUL***If this field is present, the start of the *drx-HARQ-RTT-TimerUL* is after the last transmission within a bundle, see TS 38.321 [3]. |
| ***g-RNTI-ConfigToAddModList***List of G-RNTI configurations to add or modify. |
| ***g-RNTI-ConfigToReleaseList***List of G-RNTI configurations to release. |
| ***g-CS-RNTI-ConfigToAddModList***List of G-CS-RNTI configurations to add or modify. |
| ***g-CS-RNTI-ConfigToReleaseList***List of G-CS-RNTI configurations to release. |
| ***intraCG-Prioritization***Used to enable HARQ process ID selection based on LCH-priority for one CG as specified in TS 38.321 [3]. |
| ***lch-BasedPrioritization***If this field is present, the corresponding MAC entity of the UE is configured with prioritization between overlapping grants and between scheduling request and overlapping grants based on LCH priority, see TS 38.321 [3]. The network does not configure *lch-BasedPrioritization* with *enhancedSkipUplinkTxDynamic* simultaneously nor *lch-BasedPrioritization* with *enhancedSkipUplinkTxConfigured* simultaneously. |
| ***schedulingRequestID-BFR-SCell***Indicates the scheduling request configuration applicable for BFR on SCell, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-BFR-r17***Indicates the scheduling request configuration (SchedulingRequestConfig) that the UE shall use upon detecting a beam failure on the detection resources configured in BFDset of a serving cell but not on resources configured in BFDset2 of the same serving cell.*Editor's note: BFDset and BFDset2 configuration is pending on LS response from RAN1.* |
| ***schedulingRequestID-BFR2-r17***Indicates the scheduling request configuration (SchedulingRequestConfig) that the UE shall use upon detecting a beam failure on the detection resources configured in BFDset2 of a serving cell but not on resources configured in BFDset of the same serving cell.*Editor's note: BFDset and BFDset2 configuration is pending on LS response from RAN1.* |
| ***schedulingRequestID-LBT-SCell***Indicates the scheduling request configuration applicable for consistent uplink LBT recovery on SCell, as specified in TS 38.321 [3]. |
| ***skipUplinkTxDynamic, enhancedSkipUplinkTxDynamic, enhancedSkipUplinkTxConfigured***If set to *true*, the UE skips UL transmissions as described in TS 38.321 [3]. If the UE is configured with *enhancedSkipUplinkTxDynamic* or *enhancedSkipUplinkTxConfigured* with value *true*, REPETITION\_NUMBER (as specified in TS 38.321 [3], clause 5.4.2.1) of the corresponding PUSCH transmission of the uplink grant shall be equal to 1. |
| ***tag-Config***The field is used to configure parameters for a time-alignment group. The field is not present if any DAPS bearer is configured. |
| ***usePreBSR***If set to true, the MAC entity of the IAB-MT may use the Pre-emptive BSR, see TS 38.321 [3]. |

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| ***MBS-RNTI-SpecificConfig* field descriptions** |
| ***drx-ConfigPTM***Used to configure DRX for PTM transmission as specified in TS 38.321 [3]. |
| ***g-CS-RNTI***Used to scramble the SPS group-common PDSCH and activation/deactivation of SPS group-common PDSCH for one or more MBS multicast services. |
| ***g-RNTI***Used to scramble the scheduling and transmission of PTM for one or more MBS multicast services. |
| ***groupCommon-RNTI***Used to configure g-RNTI or g-CS-RNTI. |
| ***harq-FeedbackEnablerMulticast***Indicates whether the UE shall provide HARQ feedback for MBS multicast. Value *dci-enabler* means that whether the UE shall provide HARQ feedback for MBS multicast is indicated by DCI. Value *enabled* means the UE shall always provide HARQ feedback for MBS multicast. When the field is absent, the value "*disabled*" is used as defined in TS 38.213 [3]. |
| ***harq-FeedbackOptionMulticast***Indicates the feedback mode for MBS multicast dynamically scheduled PDSCH or SPS PDSCH. |
| ***mbs-RNTI-SpecificConfigId***An identifier of the RNTI specific configuration for MBS multicast. |
| ***pdsch-AggregationFactorMulticast***Number of repetitions for dynamically scheduled MBS multicast data (see TS 38.214 [19], clause 5.1.2.1). When the field is absent and *groupCommon-RNTI* is set to *g-RNTI*, the UE applies the value 1. |

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| **Conditional Presence** | **Explanation** |
| *G-RNTI* | This field is optionally present, Need S, if *groupCommon-RNTI* is set to *g-RNTI*. The field is absent when *groupCommon-RNTI* is set to *g-CS-RNTI*. |
| *HARQFeedback* | The field is mandatory present when *harq-FeedbackEnablerMulticast* is present. It is absent otherwise.  |
| *MCG-Only* | This field is optionally present, Need M, for the *MAC-CellGroupConfig* of the MCG. It is absent otherwise. |
| *LCH-PrioWithReTxTimer* | This field is optionally present, Need R, if lch-BasedPrioritization-r16 is configured in this MAC entity and cg-RetransmissionTimer-r16 is configured for any configured grant configuration associated with this MAC entity. It is absent otherwise, Need R. |

*END OF CHANGE*

*START OF CHANGE*

### 6.3.3 UE capability information elements

<<< UNCHANGED PARTS OMITTED >>>

– *MAC-Parameters*

The IE *MAC-Parameters* is used to convey capabilities related to MAC.

***MAC-Parameters* information element**

-- ASN1START

-- TAG-MAC-PARAMETERS-START

MAC-Parameters ::= SEQUENCE {

 mac-ParametersCommon MAC-ParametersCommon OPTIONAL,

 mac-ParametersXDD-Diff MAC-ParametersXDD-Diff OPTIONAL

}

MAC-Parameters-v1610 ::= SEQUENCE {

 mac-ParametersFRX-Diff-r16 MAC-ParametersFRX-Diff-r16 OPTIONAL

}

MAC-Parameters-v1700 ::= SEQUENCE {

 mac-ParametersFR2-2-r17 MAC-ParametersFR2-2-r17 OPTIONAL

}

MAC-ParametersCommon ::= SEQUENCE {

 lcp-Restriction ENUMERATED {supported} OPTIONAL,

 dummy ENUMERATED {supported} OPTIONAL,

 lch-ToSCellRestriction ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 recommendedBitRate ENUMERATED {supported} OPTIONAL,

 recommendedBitRateQuery ENUMERATED {supported} OPTIONAL

 ]],

 [[

 recommendedBitRateMultiplier-r16 ENUMERATED {supported} OPTIONAL,

 preEmptiveBSR-r16 ENUMERATED {supported} OPTIONAL,

 autonomousTransmission-r16 ENUMERATED {supported} OPTIONAL,

 lch-PriorityBasedPrioritization-r16 ENUMERATED {supported} OPTIONAL,

 lch-ToConfiguredGrantMapping-r16 ENUMERATED {supported} OPTIONAL,

 lch-ToGrantPriorityRestriction-r16 ENUMERATED {supported} OPTIONAL,

 singlePHR-P-r16 ENUMERATED {supported} OPTIONAL,

 ul-LBT-FailureDetectionRecovery-r16 ENUMERATED {supported} OPTIONAL,

 -- R4 8-1: MPE

 tdd-MPE-P-MPR-Reporting-r16 ENUMERATED {supported} OPTIONAL,

 lcid-ExtensionIAB-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 spCell-BFR-CBRA-r16 ENUMERATED {supported} OPTIONAL

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 [[

 srs-ResourceId-Ext-r16 ENUMERATED {supported} OPTIONAL

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 [[

 enhancedUuDRX-forSidelink-r17 ENUMERATED {supported} OPTIONAL,

 --27-10: Support of UL MAC CE based MG activation request for PRS measurements

 mg-ActivationRequestPRS-Meas-r17 ENUMERATED {supported} OPTIONAL,

 --27-11: Support of DL MAC CE based MG activation request for PRS measurements

 mg-ActivationCommPRS-Meas-r17 ENUMERATED {supported} OPTIONAL,

 intraCG-Prioritization-r17 ENUMERATED {supported} OPTIONAL,

 jointPrioritizationCG-Retx-Timer-r17 ENUMERATED {supported} OPTIONAL,

 survivalTime-r17 ENUMERATED {supported} OPTIONAL,

 lcg-ExtensionIAB-r17 ENUMERATED {supported} OPTIONAL,

 maxNumberRNTIs-MBS-r17 INTEGER (1..ffsUpperLimit) OPTIONAL, -- FFS

 harq-FeedbackDisabled-r17 ENUMERATED {supported} OPTIONAL,

 uplink-Harq-ModeB-r17 ENUMERATED {supported} OPTIONAL,

 sr-TriggeredBy-TA-Report-r17 ENUMERATED {supported} OPTIONAL,

 extendedDRX-CycleInactive-r17 ENUMERATED {supported} OPTIONAL

 ]],

 lastTransmissionUL-r17 ENUMERATED {supported} OPTIONAL

 ]]

}

MAC-ParametersFRX-Diff-r16 ::= SEQUENCE {

 directMCG-SCellActivation-r16 ENUMERATED {supported} OPTIONAL,

 directMCG-SCellActivationResume-r16 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivation-r16 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivationResume-r16 ENUMERATED {supported} OPTIONAL,

 -- R1 19-1: DRX Adaptation

 drx-Adaptation-r16 SEQUENCE {

 non-SharedSpectrumChAccess-r16 MinTimeGap-r16 OPTIONAL,

 sharedSpectrumChAccess-r16 MinTimeGap-r16 OPTIONAL

 } OPTIONAL,

 ...

}

MAC-ParametersFR2-2-r17 ::= SEQUENCE {

 directMCG-SCellActivation-r17 ENUMERATED {supported} OPTIONAL,

 directMCG-SCellActivationResume-r17 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivation-r17 ENUMERATED {supported} OPTIONAL,

 directSCG-SCellActivationResume-r17 ENUMERATED {supported} OPTIONAL,

 drx-Adaptation-r17 SEQUENCE {

 non-SharedSpectrumChAccess-r17 MinTimeGapFR2-2-r17 OPTIONAL,

 sharedSpectrumChAccess-r17 MinTimeGapFR2-2-r17 OPTIONAL

 } OPTIONAL,

 ...

}

MAC-ParametersXDD-Diff ::= SEQUENCE {

 skipUplinkTxDynamic ENUMERATED {supported} OPTIONAL,

 logicalChannelSR-DelayTimer ENUMERATED {supported} OPTIONAL,

 longDRX-Cycle ENUMERATED {supported} OPTIONAL,

 shortDRX-Cycle ENUMERATED {supported} OPTIONAL,

 multipleSR-Configurations ENUMERATED {supported} OPTIONAL,

 multipleConfiguredGrants ENUMERATED {supported} OPTIONAL,

 ...,

 [[

 secondaryDRX-Group-r16 ENUMERATED {supported} OPTIONAL

 ]],

 [[

 enhancedSkipUplinkTxDynamic-r16 ENUMERATED {supported} OPTIONAL,

 enhancedSkipUplinkTxConfigured-r16 ENUMERATED {supported} OPTIONAL

 ]]

}

MinTimeGap-r16 ::= SEQUENCE {

 scs-15kHz-r16 ENUMERATED {sl1, sl3} OPTIONAL,

 scs-30kHz-r16 ENUMERATED {sl1, sl6} OPTIONAL,

 scs-60kHz-r16 ENUMERATED {sl1, sl12} OPTIONAL,

 scs-120kHz-r16 ENUMERATED {sl2, sl24} OPTIONAL

}

MinTimeGapFR2-2-r17 ::= SEQUENCE {

 scs-120kHz-r17 ENUMERATED {sl2, sl24} OPTIONAL,

 scs-480kHz-r17 ENUMERATED {sl8, sl96} OPTIONAL,

 scs-960kHz-r17 ENUMERATED {sl16, sl192} OPTIONAL

}

-- TAG-MAC-PARAMETERS-STOP

-- ASN1STOP

*END OF CHANGE*