3GPP RAN WG2 Meeting #110-e R2-2005151
June 1st – 12th, 2020

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| *CR-Form-v11.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.331** | **CR** | **yyyy** | **rev** | **-** | **Current version:** | **16.0.0** |  |
|  |
| *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:***  | Addition of MPE reporting to TS 38.331 |
|  |  |
| ***Source to WG:*** |  |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_RF\_FR2\_req\_enh |  | ***Date:*** | 2020-05-21 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***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:*** | In FR2, there are requirements for maximum permitted exposure (MPE), whereby the UE measures its average energy level over a period. Currently the UEs may signal maxUplinkDutyCycle-FR2 as a capability. However, the gNB is not bounded by any rules to meet this limit, since the MPE limit can be exceeded at different power levels, being computed as an averaged power density over a certain period. The only method used today is P-MPR and this can be quite drastic, leading to possible loss of UL connection and thus followed by a Connection Release.In RAN4’s LS (R4-2005670), RAN4 is asking RAN2 to introduce MAC-CE to signal measured P-MPR MPE estimate when P-MPR is higher than a configurable threshold. |
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| ***Summary of change:*** | 1. IE MPE-Config is added to configure parameters for MPE reporting, including the MPE P-MPR threshold and the a prohibit timer for reporting.
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| ***Consequences if not approved:*** | MPE reporting functionality is not introduced |
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| ***Clauses affected:*** | 6.3.2, 6.3.3 |
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|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS/TR 38.321 CR 0751 |
| ***affected:*** |  | **X** |  Test specifications |  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications |  |
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| ***Other comments:*** |  |

6.3.2 Radio resource control information elements

*<Start of modification 1>*

– *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 M

 lbt-FailureRecoveryConfig-r16 LBT-FailureRecoveryConfig-r16 OPTIONAL, -- Need M

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

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

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

 MPE-P-MPR-Config-r16 SetupRelease { FR2-MPE-P-MPR-Config-r16 } OPTIONAL -- Need M

 ]]

}

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

-- TAG-MAC-CELLGROUPCONFIG-STOP

-- ASN1STOP

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| ***MAC-CellGroupConfig* field descriptions** |
| ***usePreBSR***If set to true, the MAC entity of the IAB-MT will activate the pre-BSR. |
| ***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***Used to configure DRX as specified in TS 38.321 [3]. |
| ***lch-BasedPrioritization***If this field is present, the UE is configured with prioritization between overlapping grants and between scheduling request and overlapping grants based on LCH priority, see see TS 38.321 [3]. Editor's Note: It is FFS whether SR/data prioritization can be a separate configurable parameter from data/data prioritization. |
| ***MPE-P-MPR-Config***Configures FR2 MPE P-MPR reporting, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-BFR-SCell***If present, it indicates the scheduling request configuration applicable for BFR on SCell, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-LBT-SCell***Indicates the scheduling request configuration applicable for consistent uplink LBT recovery on SCell, as specified in TS 38.321 [3]. |
| ***skipUplinkTxDynamic***If set to *true*, the UE skips UL transmissions as described in TS 38.321 [3]. |

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| **Conditional Presence** | **Explanation** |
| *MCG-Only* | This field is optionally present, Need M, for the *MAC-CellGroupConfig* of the MCG. It is absent otherwise. |

*<End of modification 1>*

*<Start of modification 2>*

The **IE *MPE-P-MPR-Config*** is used to configure parameters for MPE reporting.

***MPE-Config* information element**

-- ASN1START

-- TAG-MPE-CONFIG-START

MPE-Config ::= SEQUENCE {

 mpe-ProhibitTimer ENUMERATED { sf10, sf20, sf50, sf100, sf200, sf500, sf1000},

 mpe-threshold INTEGER (0..7) ,

 ...

}

-- TAG-MPE-CONFIG-STOP

-- ASN1STOP

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| ***MPE-Config* field descriptions** |
| ***mpe-ProhibitTimer***Value in number of subframes for MPE reporting as specified in TS 38.321 [3]. Value sf0 corresponds to 0 subframe, value *sf100* corresponds to 100 subframes, and so on. |
| ***mpe-threshold*** Value of the P-MPR threshold in *dB* for reporting FR2 MPE P-MPR, as specified in TS 38.321 [3]. |

*<End of modification 2>*

### 6.3.3 UE capability information elements

*<Start of modification 3>*

– *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-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

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}

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,

 ... ,

 [[

 p-MPR-ReportingFR2-r16 ENUMERATED {supported} OPTIONAL

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}

-- TAG-MAC-PARAMETERS-STOP

-- ASN1STOP

*<End of modification 3>*