**3GPP TSG-RAN WG2 Meeting#123bis *R2-230xxxx***

**Xiamen, China, 9th-13th October 2023**

|  |
| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **38.306** | **CR** | **draftCR** | **rev** | **-** | **Current version:** | **17.6.0** |  |
|  |
| *For* [***HELP***](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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME | **x** | Radio Access Network | **x** | Core Network |  |

|  |
| --- |
|  |
| ***Title:***  | Introduction of eMBS UE Capabilities into TS 38.306 |
|  |  |
| ***Source to WG:*** | vivo |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_MBS\_enh-Core |  | ***Date:*** | 2023-10-27 |
|  |  |  |  |  |
| ***Category:*** | **B** |  | ***Release:*** | Rel-18 |
|  | *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:*** | Introduction of Rel-18 eMBS related capabilities |
|  |  |
| ***Summary of change:*** | 1. *ptm-RetransmissionInactive-r18* capability is added to 4.2.6;*2. dynamicMulticastInactive-r18* capability is added to 4.2.7.5;3. *broadcastNonServingCell-r18* capability is added to 4.2.7.6. |
|  |  |
| ***Consequences if not approved:*** | The Rel-18 eMBS feature is not completed. |
|  |  |
| ***Clauses affected:*** | 4.2.6, 4.2.7.5, 4.2.7.6 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS/TR 38.331 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 THE CHANGE**

### 4.2.6 MAC parameters

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Definitions for parameters | Per | M | FDD-TDD DIFF | FR1-FR2 DIFF |
| ***autonomousTransmission-r16***Indicates whether the UE supports autonomous transmission of the MAC PDU generated for a deprioritized configured uplink grant as specified in TS 38.321 [8]. A UE supporting this feature shall also support *lch-priorityBasedPrioritization-r16*. | UE | No | No | No |
| ***directMCG-SCellActivation-r16, directMCG-SCellActivation-r17***Indicates whether the UE supports direct NR MCG SCell activation, as specified in TS 38.321 [8], upon SCell addition, upon reconfiguration with sync of the MCG, as specified in TS 38.331 [9]. | UE | No | No | Yes (Incl FR2-2 DIFF) |
| ***directMCG-SCellActivationResume-r16, directMCG-SCellActivationResume-r17***Indicates whether the UE supports direct NR MCG SCell activation, as specified in TS 38.321 [8], upon reception of an *RRCResume* message, as specified in TS 38.331 [9]. | UE | No | No | Yes (Incl FR2-2 DIFF) |
| ***directSCG-SCellActivation-r16, directSCG-SCellActivation-r17***Indicates whether the UE supports direct NR SCG SCell activation, as specified in TS 38.321 [8], upon SCell addition and upon reconfiguration with sync of the SCG, both performed via an *RRCReconfiguration* message received via SRB3 or contained in an *RRC(Connection)Reconfiguration* message received via SRB1, as specified in TS 38.331 [9] and TS 36.331 [17].A UE indicating support of *directSCG-SCellActivation-r16* shall indicate support of EN-DC or support of NGEN-DC as specified in TS 36.331 [17] or support of NR-DC as specified in TS 38.331 [9]. | UE | No | No | Yes (Incl FR2-2 DIFF) |
| ***directSCG-SCellActivationResume-r16, directSCG-SCellActivationResume-r17***Indicates whether the UE supports direct NR SCG SCell activation, as specified in TS 38.321 [8]:- upon reception of an *RRCReconfiguration* included in an *RRCConnectionResume* message, as specified in TS 38.331 [9] and TS 36.331 [17], if the UE indicates support of EN-DC or NGEN-DC, and support of *resumeWithSCG-Config-r16* as specified in TS 36.331 [17],- upon reception of an *RRCReconfiguration* included in an *RRCResume* message, as specified in TS 38.331 [9], if the UE indicates support of NR-DC and of *resumeWithSCG-Config-r16* as specified in TS 38.331 [9].A UE indicating support of *directSCG-SCellActivationResume-r16* shall indicate support of EN-DC or NGEN-DC and support of *resumeWithSCG-Config-r16* as specified in TS 36.331 [17] or indicate support of NR-DC and of *resumeWithSCG-Config-r16* as specified in TS 38.331 [9]. | UE | No | No | Yes (Incl FR2-2 DIFF) |
| ***drx-Adaptation-r16, drx-Adaptation-r17***Indicates whether the UE supports DRX adaptation comprised of the following functional components:- Configured *ps-Offset* for the detection of DCI format 2\_6 with CRC scrambling by *ps*-RNTI and reported *MinTimeGap* before the start of *drx-onDurationTimer* of Long DRX- Indication of UE whether or not to start *drx-onDurationTimer* for the next Long DRX cycle by detection of DCI format 2\_6- Configured UE wakeup or not when DCI format 2\_6 is not detected at all monitoring occasions outside Active Time- Configured periodic CSI report apart from L1-RSRP (*ps-TransmitOtherPeriodicCSI*) when impacted by DCI format 2\_6 that *drx-onDurationTimer* does not start for the next Long DRX cycle- Configured periodic L1-RSRP report (*ps-TransmitPeriodicL1-RSRP*) when impacted by DCI format 2\_6 that *drx-onDurationTimer* does not start for the next Long DRX cycleThe capability signalling includes the minimum time gap between the end of the slot of last DCI format 2\_6 monitoring occasion and the beginning of the slot where the UE would start the *drx-onDurationTimer* of Long DRX for each SCS. The value *sl1* indicates 1 slot. The value *sl2* indicates 2 slots, and so on. Support of this feature is reported for licensed and unlicensed bands, respectively. When this field is reported, either of *sharedSpectrumChAccess-r16* or *non-SharedSpectrumChAccess-r16* shall be reported, at least. | UE | No | No | Yes(Incl FR2-2 DIFF) |
| ***enhancedSkipUplinkTxConfigured-r16***Indicates whether the UE supports skipping UL transmission for a configured uplink grant only if no data is available for transmission and no UCI is multiplexed on the corresponding PUSCH of the uplink grant as specified in TS 38.321 [8]. | UE | No | Yes | No |
| ***enhancedSkipUplinkTxDynamic-r16***Indicates whether the UE supports skipping UL transmission for an uplink grant addressed to a C-RNTI only if no data is available for transmission and no UCI is multiplexed on the corresponding PUSCH of the uplink grant as specified in TS 38.321 [8]. | UE | No | Yes | No |
| ***enhancedUuDRX-forSidelink-r17***Indicates whether UE supports sidelink related Uu-DRX mechanisms for PDCCH monitoring. This field is only applicable if the UE supports *sl-TransmissionMode1-r16*. | UE | No | No | No |
| ***extendedDRX-CycleInactive-r17***Indicates whether UE supports the extended DRX in RRC\_INACTIVE with values of 256, 512 and 1024 radio frames as specified in TS 38.331 [9]. The UE may indicate support for extended DRX in RRC\_INACTIVE only if it supports extended DRX in RRC\_IDLE. | UE | No | No | No |
| ***harq-FeedbackDisabled-r17***Indicates whether the UE supports disabled HARQ feedback for downlink transmission. A UE supporting this feature shall also indicate the support of *nonTerrestrialNetwork-r17*. | UE | No | No | No |
| ***intraCG-Prioritization-r17***Indicates whether the UE supports the HARQ process ID selection based on LCH priority as specified in TS 38.321 [8]. A UE supporting this feature shall also support *jointPrioritizationCG-Retx-Timer-r17*. | UE | No | No | No |
| ***jointPrioritizationCG-Retx-Timer-r17***Indicates whether the UE supports simultaneous configuration of LCH based prioritization and *cg-RetransmissionTimer-r16* as specified in TS 38.321 [8]. A UE supporting this feature shall also support *lch-priorityBasedPrioritization-r16* and *configuredGrantWithReTx-r16*. | UE | No | No | No |
| ***lastTransmissionUL-r17***Indicates whether the UE supports starting the *drx-HARQ-RTT-TimerUL* after the end of the last transmission within a bundle as specified in TS 38.321 [8]. | UE | No | No | No |
| ***lch-PriorityBasedPrioritization-r16***Indicates whether the UE supports prioritization between overlapping grants and between scheduling request and overlapping grants based on LCH priority as specified in TS 38.321 [8].  | UE | No | No | No |
| ***lch-ToConfiguredGrantMapping-r16***Indicates whether the UE supports restricting data transmission from a given LCH to a configured (sub-) set of configured grant configurations (see *allowedCG-List-r16* in *LogicalChannelConfig* in TS 38.331 [9]) as specified in TS 38.321 [8].  | UE | No | No | No |
| ***lch-ToGrantPriorityRestriction-r16***Indicates whether the UE supports restricting data transmission from a given LCH to a configured (sub-) set of dynamic grant priority levels (see *allowedPHY-PriorityIndex-r16* in *LogicalChannelConfig* in TS 38.331 [9]) as specified in TS 38.321 [8].  | UE | No | No | No |
| ***lch-ToSCellRestriction***Indicates whether the UE supports restricting data transmission from a given LCH to a configured (sub-) set of serving cells (see *allowedServingCells* in *LogicalChannelConfig*). A UE supporting *pdcp-DuplicationMCG-OrSCG-DRB* or *pdcp-DuplicationSRB* (see *PDCP-Config*) shall also support *lch-ToSCellRestriction*. | UE | No | No | No |
| ***lcp-Restriction***Indicates whether UE supports the selection of logical channels for each UL grant based on RRC configured restriction using RRC parameters *allowedSCS-List*, *maxPUSCH-Duration*, and *configuredGrantType1Allowed* as specified in TS 38.321 [8]. | UE | No | No | No |
| ***logicalChannelSR-DelayTimer***Indicates whether the UE supports the *logicalChannelSR-DelayTimer* as specified in TS 38.321 [8]. | UE | No | Yes | No |
| ***longDRX-Cycle***Indicates whether UE supports long DRX cycle as specified in TS 38.321 [8]. | UE | Yes | Yes | No |
| ***mg-ActivationCommPRS-Meas-r17***Indicates whether UE supports preconfiguration of MGs in RRC signalling for PRS measurements and the use of DL MAC CE from the gNB, as specified in TS 38.321 [8], to activate/deactivate the preconfigured MG for PRS measurements. | UE | No | No | No |
| ***mg-ActivationRequestPRS-Meas-r17***Indicates whether UE supports preconfiguration of MGs in RRC signalling for PRS measurements and supports the use of UL MAC CE, as specified in TS38.321 [8], to request the activation/deactivation of the preconfigured MG for PRS measurements. The UE can include this field only if the UE supports *mg-ActivationCommPRS-Meas-r17*. | UE | No | No | No |
| ***multipleConfiguredGrants***Indicates whether UE supports more than one configured grant configurations (including both Type 1 and Type 2) in a cell group. For each cell, the UE supports at most one configured grant per BWP and the maximum number of configured grant configurations per cell group is 2. If absent, for each configured cell group, the UE only supports one configured grant configuration on one serving cell. | UE | No | Yes | No |
| ***multipleSR-Configurations***Indicates whether the UE supports 8 SR configurations per PUCCH cell group as specified in TS 38.321 [8]. | UE | No | Yes | No |
| ***ptm-RetransmissionInactive-r18***Indicates whether the UE supports PTM retransmission by starting the *drx-HARQ-RTT-TimerDL-PTM* and *drx-RetransmissionTimerDL-PTM* during multicast reception in RRC\_INACTIVE state as specified in TS 38.321 [8]. A UE supporting this feature shall also indicate support of*dynamicMulticastInactive-r18*. | UE | No | Yes | No |
| ***recommendedBitRate***Indicates whether the UE supports the bit rate recommendation message from the gNB to the UE as specified in TS 38.321 [8]. | UE | No | No | No |
| ***recommendedBitRateMultiplier-r16***Indicates whether the UE supports the bit rate multiplier for recommended bit rate MAC CE as specified in TS 38.321 [8], clause 6.1.3.20. This field is only applicable if the UE supports recommendedBitRate. | UE | No | No | No |
| ***recommendedBitRateQuery***Indicates whether the UE supports the bit rate recommendation query message from the UE to the gNB as specified in TS 38.321 [8]. This field is only applicable if the UE supports *recommendedBitRate*. | UE | No | No | No |
| ***secondaryDRX-Group-r16***Indicates whether UE supports secondary DRX group as specified in TS 38.321 [8]. | UE | No | Yes | No |
| ***shortDRX-Cycle***Indicates whether UE supports short DRX cycle as specified in TS 38.321 [8]. | UE | Yes | Yes | No |
| ***simultaneousSR-PUSCH-DiffPUCCH-groups-r17***Indicates whether the UE supports simultaneous transmission of SR and PUSCH in different PUCCH groups as specified in TS 38.321 [8]. | UE | No | No | No |
| ***singlePHR-P-r16***Indicates whether UE supports the P bit in single PHR MAC CE as specified in TS 38.321 [8]. | UE | No | No | No |
| ***skipUplinkTxDynamic***Indicates whether the UE supports skipping of UL transmission for an uplink grant indicated on PDCCH if no data is available for transmission as specified in TS 38.321 [8]. | UE | No | Yes | No |
| ***spCell-BFR-CBRA-r16***Indicates whether the UE supports sending BFR MAC CE for SpCell BFR as specified in TS 38.321 [8]. | UE | No | No | No |
| ***srs-ResourceId-Ext-r16***Indicates whether the UE supports the extended 6-bit (Positioning) SRS resource ID in SP Positioning SRS Activation/Deactivation MAC CE, as specified in TS 38.321 [8]. | UE | No | No | No |
| ***sr-TriggeredBy-TA-Report-r17***Indicates whether the UE supports triggering of SR when a TA report is triggered and there are no available UL-SCH resources. A UE supporting this feature shall also indicate the support of *nonTerrestrialNetwork-r17*. | UE | No | No | No |
| ***survivalTime-r17***Indicates whether the UE supports services with survival time requirement using configured grant resource and PDCP duplication, as specified in TS 38.321 [8]. A UE supporting this feature shall support *pdcp-DuplicationMCG-orSCG-DRB* or *pdcp-DuplicationSplitDRB*. A UE supporting this feature shall also support *configuredUL-GrantType1-v1650* or *configuredUL-GrantType2-v1650*. | UE | No | No | No |
| ***tdd-MPE-P-MPR-Reporting-r16***Indicates whether the UE supports P-MPR reporting for Maximum Permissible Exposure, as specified in TS38.321 [8]. | UE | No | TDD only | FR2 only |
| *ul-LBT-FailureDetectionRecovery-r16*Indicates whether the UE supports consistent uplink LBT detection and recovery, as specified in TS 38.321 [8], for cells operating with shared spectrum channel access.This field applies to all serving cells with which the UE is configured with shared spectrum channel access. | UE | No | No | No |
| ***uplink-Harq-ModeB-r17***Indicates whether the UE supports HARQ Mode B and the corresponding LCP restrictions for uplink transmission. A UE supporting this feature shall also indicate the support of *nonTerrestrialNetwork-r17*. | UE | No | No | No |

**NEXT CHANGE**

#### 4.2.7.5 *FeatureSetDownlink* parameters

< unchanged part is omitted>

| ***dynamicMulticastInactive-r18***Indicates whether the UE supports dynamic scheduling for multicast for PCell Bcomprised of the following functional components:- Supports group-common PDCCH/PDSCH for multicast with CRC scrambled by G-RNTI in RRC\_INACTIVE;- Supports group-common PDCCH/PDSCH for multicast with CRC scrambled by multicast MCCH-RNTI;- Supports CFR configuration for multicast in RRC\_INACTIVE;- Supports CORESET and common search space configuration for multicast in RRC\_INACTIVE;- Supports DCI format 4\_1 with CRC scrambled with G-RNTI for multicast in RRC\_INACTIVE;- Supports DCI format 4\_0 with CRC scrambled with multicast MCCH-RNTI;- MCCH change notification indication via DCI;- One G-RNTI per UE is supported for multicast reception in RRC\_INACTIVE;- Supports semi-static slot-level repetition up to 16 for group-common PDSCH for multicast in RRC\_INACTIVE;- Supports inter-slot TDM between group-common PDSCH for multicast in RRC\_INACTIVE and other PDSCHs, or between multicast MCCH group-common PDSCH and MTCH group-common PDSCH for multicast in RRC\_INACTIVE, or among multicast MCCH group-common PDSCH and MTCH group-common PDSCH for multicast in RRC\_INACTIVE and other PDSCHs in different slots;- Support of FDMed multicast MCCH and PBCH;- Support of up to 64QAM for FR1/FR2;- Support 12-bit length of PDCP sequence number;- Support of ROHC profiles 0x0000, 0x0001, and 0x0002;- Support 4 ROHC header compression context sessions as the minimum number;- Support UM MRB with 12-bit length of RLC sequence number;- Support UM MRB with 6-bit length of RLC sequence number;- Supports long DRX cycle for MBS multicast reception in RRC\_INACTIVE. | FS | No | N/A | N/A |
| --- | --- | --- | --- | --- |

Editor's Note: the granularity of capability is based on *dynamicMulticastPCell-r17*. It can be revisited (e.g. per FSPC or per Band).

< unchanged part is omitted>

**NEXT CHANGE**

#### 4.2.7.6 *FeatureSetDownlinkPerCC* parameters

< unchanged part is omitted>

| ***broadcastNonServingCell-r18***Indicates whether the UE supports MBS broadcast reception from a non-serving cell.NOTE: The UE is not required to receive simultaneously on the serving cell(s) and a non-serving cell.  | FSPC | No | N/A | N/A |
| --- | --- | --- | --- | --- |

< unchanged part is omitted>

**END OF THE CHANGE**

# Annex: UE feature list

UE eMBS capabilities in the feature list format for TR 38.822 are included as follows,

### X.Y.Z NR\_MBS\_enh-Core

Table X.Y.Z-1: Layer-2 and Layer-3 feature list for NR\_MBS\_enh-Core

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Features | Index | Feature group | Components | Prerequisite feature groups | Field name in TS 38.331 | Parent IE in TS 38.331 | Need of FDD/TDD differentiation | Need of FR1/FR2 differentiation | Note | Mandatory/Optional |
| a. NR\_MBS\_enh-Core | a-1 | Dynamic scheduling for multicast reception in RRC\_INACTIVE state | 1. Supports group-common PDCCH/PDSCH for multicast with CRC scrambled by G-RNTI in RRC\_INACTIVE;
2. Supports group-common PDCCH/PDSCH for multicast with CRC scrambled by multicast MCCH-RNTI;
3. Supports CFR configuration for multicast in RRC\_INACTIVE;
4. Supports CORESET and common search space configuration for multicast in RRC\_INACTIVE;
5. Supports DCI format 4\_1 with CRC scrambled with G-RNTI for multicast in RRC\_INACTIVE;
6. Supports DCI format 4\_0 with CRC scrambled with multicast MCCH-RNTI;
7. MCCH change notification indication via DCI;
8. One G-RNTI per UE is supported for multicast reception in RRC\_INACTIVE;
9. Supports semi-static slot-level repetition up to 16 for group-common PDSCH for multicast in RRC\_INACTIVE;
10. Supports inter-slot TDM between group-common PDSCH for multicast in RRC\_INACTIVE and other PDSCHs, or between multicast MCCH group-common PDSCH and MTCH group-common PDSCH for multicast in RRC\_INACTIVE, or among multicast MCCH group-common PDSCH and MTCH group-common PDSCH for multicast in RRC\_INACTIVE and other PDSCHs in different slots;
11. Support of FDMed multicast MCCH and PBCH;
12. Support of up to 64QAM for FR1/FR2;
13. Support 12 bit length of PDCP sequence number;
14. Support of ROHC profiles 0x0000, 0x0001, and 0x0002;
15. Support 4 ROHC header compression context sessions as the minimum number;
16. Support UM MRB with 12 bit length of RLC sequence number;
17. Support UM MRB with 6 bit length of RLC sequence number;
18. Supports long DRX cycle for MBS multicast reception in RRC\_INACTIVE.
 |  | *dynamicMulticastInactive-r18* | *FeatureSetDownlink-v18xy* | N/A | N/A |  | Optional with capability signaling |
| a. NR\_MBS\_enh-Core | a-2 | Support of PTM transmission for multicast reception in RRC\_INACTIVE state | Indicates whether the UE supports PTM retransmission by starting the *drx-HARQ-RTT-TimerDL-PTM* and *drx-RetransmissionTimerDL-PTM* during multicast reception in RRC\_INACTIVE state as specified in TS 38.321 [8]. | A UE supporting this feature shall also indicate support of*dynamicMulticastInactive-r18*. | *ptm-RetransmissionInactive-r18* | *MAC-ParametersXDD-Diff* | Yes | No |  | Optional with capability signalling |
| a. NR\_MBS\_enh-Core | a-3 | Support of MBS reception via broadcast from a non-serving cell  | Indicates whether the UE supports MBS reception via broadcast from a non-serving cell. |  | *broadcastNonServingCell-r18* | *FeatureSetDownlinkPerCC-v18xy* | N/A | N/A |  | Optional with capability signalling |