**3GPP TSG-RAN2 Meeting # 130R2-250**

**Wuhan, P. R. China, 7 – 11 Apr, 2025**

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| *CR-Form-v12.3* |
| **CHANGE REQUEST** |
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|  | **38.331** | **CR** | draftCR | **rev** | - | **Current version:** | 18.4.0 |  |
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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:***  | Introduction of R19 XR enhancements for RRC spec |
|  |  |
| ***Source to WG:*** | Huawei, HiSilicon |
| ***Source to TSG:*** | R2 |
|  |  |
| ***Work item code:*** | NR\_XR\_Ph3-Core |  | ***Date:*** | 2025-04-07 |
|  |  |  |  |  |
| ***Category:*** | B |  | ***Release:*** | Rel-19 |
|  | *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-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19) Rel-20 (Release 20)* |
|  |  |
| ***Reason for change:*** | **Agreement#1**: Regarding LCP enhancments * During RAN2#126,: it was agreed that *For delay-aware LCP enhancement, RAN2 considers the following option to override/adjust the priority of LCH: based on delay/deadline information as a baseline:Use additional priority configured to LCHs in case of these LCHs with delay-critical data.*
* During RAN2#127bis, it was finally agreed that *Introduce an independent per-LCH remaining time threshold for applying delay-critical priority. We do not introduce any setting restrictions of this new remaining time threshold with relation to DSR triggering threshold.*
* During R2#129, it was further confirmed that *Only one additional priority is configured to an LCH for LCP enhancement*

**Agreement#2**: Regarding DSR enhancement * During RAN2#126, , it was agreed that *Enhance DSR to report with multiple pairs of remaining time and buffer size for the LCG*.
* During RAN2#127, it was agreed that *Network should be able to configure multiple remaining time thresholds for reporting for each LCG to report multiple pairs of remaining time and buffer sizes per LCG*
* During RAN2#129, it was further confirmed that
	+ *Different LCGs may be configured with different number of reporting thresholds.*
	+ *Different LCGs may be configured with different number of reporting thresholds*
	+ *Do not support a configuration of an LCG without any triggering threshold but with DSR reporting threshold(s).*

**Agreement#3**: Regarding RLC enhancement for avoiding uncessary retransmissions by Rx-initiated approach* During RAN2#127, , it was agreed that *In the RX-initiated approach for avoiding unnecessary retransmissions, RLC receiver abandons missing SDUs like already done by PDCP, i.e. based on a timer*,
* During RAN2#128, it was agreed that *A new RLC timer at the Rx is introduced to determine obsolete RLC SDUs. The timer starts when the gap is detected at RLC layer*

**Agreement#4**: During RAN2#128, regarding LCP prioritization, it was agreed that *As an optional capability, the UE can also support to fallback to default priority in the 2nd round of LCP*. **Agreement#5**: During RAN2#128, regarding DSR enhancements, it was agreed that *The UE may also support including non-delay critical data ahead of delay critical data in the buffer size calculation for DSR, which is a capability indicated to the NW*. **Agreement#6:** During RAN2#127bis, we have agreed that *For the sake of RAN2 discussions, we use the following terms: triggering threshold, reporting threshold(s)***Agreement#7:** Regarding avoiding unecessary retransmissions by Tx-initiated approach* During RAN2#126, it was agreed that *For Tx initiated approach: Tx side stops retrasnmit obsolete SDUs*
* During RAN2#127, it was agreed that *In addition to Tx and Rx approaches, RAN2 will consider a combined Rx and Tx approach, where Tx side stops to retransmit an obsolete SDUs based on the discard indication/a number of retransmissions as for Tx initiated approach*.
* During RAN2#127bis, it was agreed that *RAN2 will adopt a “combined” approach for avoiding unnecessary RLC retransmissions, i.e. TX side stops transmissions of an outdated SDU*.
* During R2#129, it was agreed that *The duration of the new RLC timer is not lower than that of t-reassembly*

**Agreement#8:** Regarding RLC enhancement for timely RLC retransmission, * During RAN2#127bis, it was agreed that *Focus the discussion on autonomous retransmission and polling enhancements, e.g. we need to understand how each option affects the capacity and packet delay*
* During RAN2#128, it was agreed that *Timely RLC retransmission solution covers both autonomous retransmission and polling enhancement and NW can configure either or both of them*.
* During RAN2#129, it was agreed that *Autonomous retransmission and/or polling should be triggered when the remaining time of an RLC SDU falls below a specified threshold. FFS if remaining time is determined based on discardTimer at PDCP or new timer at RLC*

**Agreement#9**: Regarding polling enhacnements, during R2#129, it was agreed that *Autonomous retransmission and/or polling should be triggered when the remaining time of an RLC SDU falls below a specified threshold. FFS if remaining time is determined based on discardTimer at PDCP or new timer at RLC***Agreement#10**: regarding the available bit rate query, it was agreed that -*The rate query MAC CE is configurable by the network, i.e. the network may turn it off completely (same as legacy).* |
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| ***Summary of change:*** | **Change#1**: Add additional priority and remaining time threshold configuration for logical channel configuration**Change#2**: Add multiple remaining time reporting thresholds per LCG for enhanced DSR report.**Change#3.1**: For RLC AM, add configuration for a local timer for Rx-based discard.**Change#3.2**: Clarify that the new RLC timer is not lower than that of t-reassembly**Change#4**: ~~Add indication for supporting fallback to default priority in the 2~~~~nd~~ ~~round of LCP.~~ Voided, FFS**Chagne#5:** Add indication for supporting to inlcude non-delay critical data in the enhanced DSR report.**Change#6:** Voided**Change#7**: Add indication for whether the Tx side of the RLC AM should stop RLC retransmission of obsolete SDUs**Change#8**: Add remaing time threshold for autonomous retransmission.**Change#9**: Add remaining time threshold for polling enhancement**Change#10**: Add a NOTE for further study how to configure whether bit rate query is enabled. |
|  |  |
| ***Consequences if not approved:*** | The enhancements introduced in R19 for XR cannot be supported |
|  |  |
| ***Clauses affected:*** | 6.3.2, 6.4 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** | **X** |  |  Other core specifications  | TS 38.300 CR TS 38.306 CR TS 38.321 CR TS 38.322 CR TS 38.323 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:*** | 1st version in RAN2#129 as R2-25012462nd version in RAN2#120 as R2-250xxxx |

=================================================FIRST CHANGE================================================================

### 6.3.2 Radio resource control information elements

– *LogicalChannelConfig*

The IE *LogicalChannelConfig* is used to configure the logical channel parameters.

***LogicalChannelConfig* information element**

-- ASN1START

-- TAG-LOGICALCHANNELCONFIG-START

LogicalChannelConfig ::= SEQUENCE {

 ul-SpecificParameters SEQUENCE {

 priority INTEGER (1..16),

 prioritisedBitRate ENUMERATED {kBps0, kBps8, kBps16, kBps32, kBps64, kBps128, kBps256, kBps512,

 kBps1024, kBps2048, kBps4096, kBps8192, kBps16384, kBps32768, kBps65536, infinity},

 bucketSizeDuration ENUMERATED {ms5, ms10, ms20, ms50, ms100, ms150, ms300, ms500, ms1000,

 spare7, spare6, spare5, spare4, spare3,spare2, spare1},

 allowedServingCells SEQUENCE (SIZE (1..maxNrofServingCells-1)) OF ServCellIndex

 OPTIONAL, -- Cond PDCP-CADuplication

 allowedSCS-List SEQUENCE (SIZE (1..maxSCSs)) OF SubcarrierSpacing OPTIONAL, -- Need R

 maxPUSCH-Duration ENUMERATED {ms0p02, ms0p04, ms0p0625, ms0p125, ms0p25, ms0p5, ms0p01-v1700, spare1}

 OPTIONAL, -- Need R

 configuredGrantType1Allowed ENUMERATED {true} OPTIONAL, -- Need R

 logicalChannelGroup INTEGER (0..maxLCG-ID) OPTIONAL, -- Need R

 schedulingRequestID SchedulingRequestId OPTIONAL, -- Need R

 logicalChannelSR-Mask BOOLEAN,

 logicalChannelSR-DelayTimerApplied BOOLEAN,

 ...,

 bitRateQueryProhibitTimer ENUMERATED {s0, s0dot4, s0dot8, s1dot6, s3, s6, s12, s30} OPTIONAL, -- Need R

 [[

 allowedCG-List-r16 SEQUENCE (SIZE (0.. maxNrofConfiguredGrantConfigMAC-1-r16)) OF ConfiguredGrantConfigIndexMAC-r16

 OPTIONAL, -- Need S

 allowedPHY-PriorityIndex-r16 ENUMERATED {p0, p1} OPTIONAL -- Need S

 ]],

 [[

 logicalChannelGroupIAB-Ext-r17 INTEGER (0..maxLCG-ID-IAB-r17) OPTIONAL, -- Need R

 allowedHARQ-mode-r17 ENUMERATED {harqModeA, harqModeB} OPTIONAL -- Need R

 ]],

 [[

 enhancedLCP-r19 SEQUENCE{

 priorityAdjustmentThreshold-r19 INTEGER (1..64),

 additionalPriority-r19 INTEGER (1..16),

-- lcp-DefaultPriorityFallback-r19 ENUMERATED {true} OPTIONAL, -- Need R

-- Editor's NOTE: FFS whether the above configuration is needed for the control of prioirty fallback during the second phase of resource allocation

 ...

 } OPTIONAL -- Need R

 ]]

 } OPTIONAL, -- Cond UL

 ...,

 [[

 channelAccessPriority-r16 INTEGER (1..4) OPTIONAL, -- Need R

 bitRateMultiplier-r16 ENUMERATED {x40, x70, x100, x200} OPTIONAL -- Need R

 ]]

}

-- TAG-LOGICALCHANNELCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***LogicalChannelConfig* field descriptions** |
| ***additionalPriority***The additional priority that overrides the logical channel priority configured by the field *priority* when condition is satisfied as specified in TS 38.321 [3]. If the field is configured, the value of the field should always be lower than that of the field *priority*. |
| ***allowedCG-List***This restriction applies only when the UL grant is a configured grant. If present, UL MAC SDUs from this logical channel can only be mapped to the indicated configured grant configuration. If the size of the sequence is zero, then UL MAC SDUs from this logical channel cannot be mapped to any configured grant configurations. If the field is not present, UL MAC SDUs from this logical channel can be mapped to any configured grant configurations. If the field configuredGrantType1Allowed is present, only those configured grant type 1 configuration indicated in this sequence are allowed for use by this logical channel; otherwise, this sequence shall not include any configured grant type 1 configuration. Corresponds to “allowedCG-List” as specified in TS 38.321 [3]. This field is ignored when SDT procedure is ongoing. |
| ***allowedHARQ-mode***Indicates the allowed HARQ mode of a HARQ process mapped to this logical channel. If the parameter is absent, there is no restriction for HARQ mode for the mapping. This field applies to SRB1, SRB2, SRB4 and DRBs. |
| ***allowedPHY-PriorityIndex***This restriction applies only when the UL grant is a dynamic grant. If the field is present and the dynamic grant has a PHY-priority index, UL MAC SDUs from this logical channel can only be mapped to the dynamic grants indicating PHY-priority index equal to the values configured by this field. If the field is present and the dynamic grant does not have a PHY-priority index, UL MAC SDUs from this logical channel can only be mapped to this dynamic grant if the value of the field is *p0*, see TS 38.213 [13], clause 9. If the field is not present, UL MAC SDUs from this logical channel can be mapped to any dynamic grants. Corresponds to “allowedPHY-PriorityIndex” as specified in TS 38.321 [3]. |
| ***allowedSCS-List***If present, UL MAC SDUs from this logical channel can only be mapped to the indicated numerology. Otherwise, UL MAC SDUs from this logical channel can be mapped to any configured numerology. Corresponds to *‘allowedSCS-List’* as specified in TS 38.321 [3].Only the following values are applicable depending on the used frequency:FR1: 15, 30, or 60 kHzFR2-1/FR2-NTN: 60 or 120 kHzFR2-2: 120, 480, or 960 kHz |
| ***allowedServingCells***If present, UL MAC SDUs from this logical channel can only be mapped to the serving cells indicated in this list. Otherwise, UL MAC SDUs from this logical channel can be mapped to any configured serving cell of this cell group. Corresponds to ‘allowedServingCells’ in TS 38.321 [3]. |
| ***bitRateMultiplier***Bit rate multiplier for recommended bit rate MAC CE as specified in TS 38.321 [3]. Value *x40* indicates bit rate multiplier 40, value *x70* indicates bit rate multiplier 70 and so on. |
| ***bitRateQueryProhibitTimer***The timer is used for bit rate recommendation query in TS 38.321 [3], in seconds. Value *s0* means 0 s, *s0dot4* means 0.4 s and so on. |
| ***bucketSizeDuration***Value in ms. *Ms5* corresponds to 5 ms, value *ms10* corresponds to 10 ms, and so on. |
| ***channelAccessPriority***Indicates the Channel Access Priority Class (CAPC), as specified in TS 38.300 [2], to be used on uplink transmissions for operation with shared spectrum channel access in FR1. The network configures this field only for SRB2 and DRBs. |
| ***configuredGrantType1Allowed***If present, or if the capability *lcp-Restriction* as specified in TS 38.306 [26] is not supported, UL MAC SDUs from this logical channel can be transmitted on a configured grant type 1. Otherwise, UL MAC SDUs from this logical channel cannot be transmitted on a configured grant type 1. Corresponds to ‘configuredGrantType1Allowed’ in TS 38.321 [3]. This field is ignored when SDT procedure is ongoing. |
| ***logicalChannelGroup, logicalChannelGroupIAB-Ext***ID of the logical channel group, as specified in TS 38.321 [3], which the logical channel belongs to. The *logicalChannelGroupIAB-Ext* is only applicable to the IAB-MT. When *logicalChannelGroupIAB-Ext* is configured, *logicalChannelGroup* shall be ignored. |
| ***lcp-DefaultPriorityFallback***Indicates during the second phase of the resource allocation among logical channels during LCP procedure in TS 38.321 [3], whether the priority of the logical channel can fallback to the default priority indicated by the field *priority* in *logicalChannelConfig* when there is no delay critical data in the logical channel.Editor’s NOTE: FFS whether the field is needed per above.FFS the definition of the first/second phase of the resource allocation in LCP. One feasible option can be some explanation in stage2 description and a reference in the field description in the RRC spec. |
| ***priorityAdjustmentThreshold***Remaining time threshold for determining whether the additional logical channel priority configured by *additionalPriority* is applied for the logical channel, as specified in TS 38.321 [3]. Value in number of milliseconds. |
| ***logicalChannelSR-Mask***Controls SR triggering when a configured uplink grant of *type1* or *type2* is configured. *True* indicates that SR masking is configured for this logical channel as specified in TS 38.321 [3]. |
| ***logicalChannelSR-DelayTimerApplied***Indicates whether to apply the delay timer for SR transmission for this logical channel. Set to *false* if *logicalChannelSR-DelayTimer* is not included in *BSR-Config*. |
| ***maxPUSCH-Duration***If present, UL MAC SDUs from this logical channel can only be transmitted using uplink grants that result in a PUSCH duration shorter than or equal to the duration indicated by this field. Otherwise, UL MAC SDUs from this logical channel can be transmitted using an uplink grant resulting in any PUSCH duration. Corresponds to “maxPUSCH-Duration” in TS 38.321 [3]. The PUSCH duration is calculated based on the same length of all symbols, and the shortest length applies if the symbol lengths are different. |
| ***Priority***Logical channel priority, as specified in TS 38.321 [3]. |
| ***prioritisedBitRate***Value in kiloBytes/s. Value *kBps0* corresponds to 0 kiloBytes/s, value *kBps8* corresponds to 8 kiloBytes/s, value *kBps16* corresponds to 16 kiloBytes/s, and so on. For SRBs, the value can only be set to *infinity*. |
| ***schedulingRequestId***If present, it indicates the scheduling request configuration applicable for this logical channel, as specified in TS 38.321 [3]. |

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| **Conditional Presence** | **Explanation** |
| *PDCP-CADuplication* | The field is mandatory present if the DRB/SRB associated with this logical channel is configured with PDCP CA duplication in UL in the cell group in which this IE is included (i.e. the PDCP entity is associated with multiple RLC entities belonging to this cell group). Otherwise the field is optionally present, need R. |
| *UL* | The field is mandatory present for a logical channel with uplink if it serves DRB or multicast MRB. It is optionally present, Need R, for a logical channel with uplink if it serves an SRB. Otherwise it is absent. |

==========================================================NEXT CHANGE========================================================

#### – *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-r16 } 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

 ]],

 [[

 schedulingRequestID-PosMG-Request-r17 SchedulingRequestId OPTIONAL, -- Need R

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

 ]],

 [[

 posMG-Request-r17 ENUMERATED {enabled} OPTIONAL -- Need R

 ]],

 [[

 drx-ConfigExt2-v1800 SetupRelease { DRX-ConfigExt2-v1800 } OPTIONAL, -- Need M

 additionalBS-TableAllowed-r18 BIT STRING (SIZE (maxNrofLCGs-r18)) OPTIONAL, -- Need R

 dsr-ConfigToAddModList-r18 SEQUENCE (SIZE (1..maxNrofLCGs-r18)) OF LCG-DSR-Config-r18 OPTIONAL, -- Need N

 dsr-ConfigToReleaseList-r18 SEQUENCE (SIZE (1..maxNrofLCGs-r18)) OF LCG-Id-r18 OPTIONAL, -- Need N

 tar-Config-r18 SetupRelease { TAR-Config-r18 } OPTIONAL -- Need M

 ]]

}

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

}

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

LCG-DSR-Config-r18 ::= SEQUENCE {

 lcg-Id-r18 LCG-Id-r18,

 remainingTimeThreshold-r18 INTEGER (1..64),

 ...,

 [[

 dsr-ReportingThresList-r19 SEQUENCE (SIZE (1.. maxDSR-ReportingThres-r19)) OF DSR-ReportingThreshold OPTIONAL, --Need R

-- dsr-ReportNonDelayCriticalData-r19 ENUMERATED {enabled} OPTIONAL -- Need R

-- Editor's NOTE: FFS whether we need RRC configuraiton for controlling whether the non-delay critical data ahead of delay critical data can be reported in DSR.

 ]]

}

LCG-Id-r18 ::= INTEGER (0..maxLCG-ID)

DSR-ReportingThreshold ::= INTEGER (1..64)

-- Editor's NOTE: FFS how to indicate whether bit rate query is enbaled. -- TAG-MAC-CELLGROUPCONFIG-STOP

-- ASN1STOP

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| --- |
| *MAC-CellGroupConfig* field descriptions |
| ***additionalBS-TableAllowed***Indicates whether a UE is allowed to utilize the refined buffer size levels, as specified in TS 38.321 [3], for a certain Logical Channel Group. The leftmost bit corresponds to LCG ID=0, second leftmost bit to LCG ID=1 and so on. The UE is allowed to utilize the refined buffer size levels for a Logical Channel Group only when the corresponding bit is set to 1. |
| ***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, drx-ConfigExt2***Used to configure DRX as specified in TS 38.321 [3]. Network only configures *drx-ConfigExt* or *drx-ConfigExt2* 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]. |
| ***dsr-ConfigToAddModList***List of LCG-specific DSR configurations to add or modify. |
| ***dsr-ConfigToReleaseList***List of LCG-specific DSR configurations to release. |
| ***g-RNTI-ConfigToAddModList***List of G-RNTI configurations to add or modify. Up to 8 G-RNTIs can be configured in total in this release based on the UE capability. |
| ***g-RNTI-ConfigToReleaseList***List of G-RNTI configurations to release. |
| ***g-CS-RNTI-ConfigToAddModList***List of G-CS-RNTI configurations to add or modify. Up to 8 G-CS-RNTIs can be configured in total in this release based on the UE capability. |
| ***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. |
| ***posMG-Request***Indicates whether UE is configured to send UL MAC CE for Positioning Measurement Gap Activation/Deactivation Request, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-BFR-SCell***Indicates the scheduling request configuration applicable for BFR on SCell, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-BFR***Indicates the scheduling request configuration (SchedulingRequestConfig) that the UE shall use upon detecting a beam failure on the detection resources configured in *failureDetectionSet1* of a serving cell while beam failure is not detected on resources configured in *failureDetectionSet2* of the same serving cell. |
| ***schedulingRequestID-BFR2***Indicates the scheduling request configuration (SchedulingRequestConfig) that the UE shall use upon detecting a beam failure on the detection resources configured in *failureDetectionSet2* of a serving cell while beam failure is not detected on resources configured in *failureDetectionSet1* of the same serving cell. |
| ***schedulingRequestID-LBT-SCell***Indicates the scheduling request configuration applicable for consistent uplink LBT recovery on SCell, as specified in TS 38.321 [3]. |
| ***schedulingRequestID-PosMG-Request***Indicates the scheduling request configuration applicable for Positioning Measurement Gap Activation/Deactivation Request, 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. The network does not configure *enhancedSkipUplinkTxDynamic* or *enhancedSkipUplinkTxConfigured* with value *true* together with *numberOfSlotsTBoMS-r17*. |
| ***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]. |

|  |
| --- |
| *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 as specified in TS 38.213 [13]. Value *enabled* means the UE shall always provide HARQ feedback for MBS multicast. When the field is absent, the UE behavior is specified in TS 38.213 [13]. |
| ***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-AggregationFactor***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. |

|  |
| --- |
| *LCG-DSR-Config* field descriptions |
| ***lcg-Id***Identifier of the Logical Channel Group which the DSR configuration refers to. |
| ***remainingTimeThreshold***Remaining time threshold used for triggering DSR (DSR triggering threshold) for the logical channels belonging to this Logical Channel Group, as specified in TS 38.321 [3]. Value in number of milliseconds. |
| ***dsr-ReportingThresList***List of DSR reporting thresholds for reporting remaining time in enhanced DSR, as specified in TS 38.321 [3]. Value for the IE *DSR-ReportingThreshold* in number of milliseconds.Editor's NOTE: exact name of the DSR MAC CE introduced in R19 to be further discussed and aligned with the MAC spec. |
| ***dsr-ReportNonDelayCriticalData***Indicates whether the UE should include the non-delay critical data ahead of delay critical data in the butter size calculation for the Logical Channel Group within the DSR as in TS 38.321 [3]. Editor's NOTE: FFS whether this RRC configuration is needed |

|  |  |
| --- | --- |
| 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. |

=======================================================NEXT CHANGE==========================================================

– *RLC-BearerConfig*

The IE *RLC-BearerConfig* is used to configure an RLC entity, a corresponding logical channel in MAC and the linking to a PDCP entity (served radio bearer).

***RLC-BearerConfig* information element**

-- ASN1START

-- TAG-RLC-BEARERCONFIG-START

RLC-BearerConfig ::= SEQUENCE {

 logicalChannelIdentity LogicalChannelIdentity,

 servedRadioBearer CHOICE {

 srb-Identity SRB-Identity,

 drb-Identity DRB-Identity

 } OPTIONAL, -- Cond LCH-SetupOnly

 reestablishRLC ENUMERATED {true} OPTIONAL, -- Need N

 rlc-Config RLC-Config OPTIONAL, -- Cond LCH-Setup

 mac-LogicalChannelConfig LogicalChannelConfig OPTIONAL, -- Cond LCH-Setup

 ...,

 [[

 rlc-Config-v1610 RLC-Config-v1610 OPTIONAL -- Need R

 ]],

 [[

 rlc-Config-v1700 RLC-Config-v1700 OPTIONAL, -- Need R

 logicalChannelIdentityExt-r17 LogicalChannelIdentityExt-r17 OPTIONAL, -- Cond LCH-SetupModMRB

 multicastRLC-BearerConfig-r17 MulticastRLC-BearerConfig-r17 OPTIONAL, -- Cond LCH-SetupOnlyMRB

 servedRadioBearerSRB4-r17 SRB-Identity-v1700 OPTIONAL -- Need N

 ]],

 [[

 rlc-Config-v19xy RLC-Config-v19xy OPTIONAL -- Need R

 ]]

}

MulticastRLC-BearerConfig-r17 ::= SEQUENCE {

 servedMBS-RadioBearer-r17 MRB-Identity-r17,

 isPTM-Entity-r17 ENUMERATED {true} OPTIONAL -- Need S

}

LogicalChannelIdentityExt-r17 ::= INTEGER (320..65855)

-- TAG-RLC-BEARERCONFIG-STOP

-- ASN1STOP

|  |
| --- |
| ***RLC-BearerConfig* field descriptions** |
| ***isPTM-Entity***If configured, indicates that the RLC entity is used for PTM reception. When the field is absent the RLC entity is used for PTP transmission/reception. |
| ***logicalChannelIdentity***ID used commonly for the MAC logical channel and for the RLC bearer. Value 4 is not configured for DRBs if SRB4 is configured. |
| ***logicalChannelIdentityExt***Extended logical channel ID used commonly for the MAC logical channel and for the RLC bearer for PTM reception. If this field is configured, the UE shall ignore *logicalChannelIdentity*. |
| ***reestablishRLC***Indicates that RLC should be re-established. Network sets this to *true* at least whenever the security key used for the radio bearer associated with this RLC entity changes. For SRB2, multicast MRBs and DRBs, unless full configuration is used, it is also set to *true* during the resumption of the RRC connection or the first reconfiguration after reestablishment. For SRB1, when resuming an RRC connection, or at the first reconfiguration after RRC connection reestablishment, the network does not set this field to *true.* The network does not include this field if *servedRadioBearer* is set to *drb-Identity* and the *RLC-BearerConfig* IE is part of an *RRCReconfiguration* message within the *LTM-Config* IE. For DRBs, network doesn't include this field if the *RLC-BearerConfig* IE is part of an *RRCReconfiguration* message associated with subsequent CPAC within the *ConditionalReconfiguration* IE. Network doesn't include this field if the *RadioBearerConfig* IE is part of an *RRCReconfiguration* message associated with subsequent CPAC within the *ConditionalReconfiguration* IE which is received within a MCG *RRCReconfiguration* message via SRB1. |
| ***rlc-Config***Determines the RLC mode (UM, AM) and provides corresponding parameters. RLC mode reconfiguration can only be performed by DRB/multicast MRB release/addition or full configuration. The network may configure *rlc-Config-v1610* only when *rlc-Config* (without suffix) is set to *am*. |
| ***servedMBS-RadioBearer***Associates the RLC Bearer with a multicast MRB. The UE shall deliver DL RLC SDUs received via the RLC entity of this RLC bearer to the PDCP entity of the *servedMBS-RadioBearer*. |
| ***servedRadioBearer, servedRadioBearerSRB4***Associates the RLC Bearer with an SRB or a DRB. The UE shall deliver DL RLC SDUs received via the RLC entity of this RLC bearer to the PDCP entity of the *servedRadioBearer*. Furthermore, the UE shall advertise and deliver uplink PDCP PDUs of the uplink PDCP entity of the *servedRadioBearer* to the uplink RLC entity of this RLC bearer unless the uplink scheduling restrictions (*moreThanOneRLC* in *PDCP-Config* and the restrictions in *LogicalChannelConfig*) forbid it to do so. |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *LCH-Setup* | This field is mandatory present upon creation of a new logical channel for a DRB or a multicast MRB or SRB4. This field is optionally present, Need S, upon creation of a new logical channel for an SRB except SRB4. It is optionally present, Need M, otherwise. |
| *LCH-SetupModMRB* | This field is optionally present upon creation of a new logical channel for PTM reception for a multicast MRB. If this field is included upon creation of a new logical channel for PTM reception for a multicast MRB, it shall be present when modifying this logical channel. The field is absent for logical channels configured for an SRB and a DRB. |
| *LCH-SetupOnly* | This field is mandatory present upon creation of a new logical channel for a DRB or an SRB (*servedRadioBearer*). It is absent, Need M otherwise. |
| LCH-SetupOnlyMRB | This field is mandatory present upon creation of a new logical channel for a multicast MRB and upon modification of *MRB-Identity* of the served MRB. It is absent, Need M otherwise. |

==========================================================NEXT CHANGE=======================================================

– *RLC-Config*

The IE *RLC-Config* is used to specify the RLC configuration of SRBs, multicast MRBs and DRBs.

***RLC-Config* information element**

-- ASN1START

-- TAG-RLC-CONFIG-START

RLC-Config ::= CHOICE {

 am SEQUENCE {

 ul-AM-RLC UL-AM-RLC,

 dl-AM-RLC DL-AM-RLC

 },

 um-Bi-Directional SEQUENCE {

 ul-UM-RLC UL-UM-RLC,

 dl-UM-RLC DL-UM-RLC

 },

 um-Uni-Directional-UL SEQUENCE {

 ul-UM-RLC UL-UM-RLC

 },

 um-Uni-Directional-DL SEQUENCE {

 dl-UM-RLC DL-UM-RLC

 },

 ...

}

UL-AM-RLC ::= SEQUENCE {

 sn-FieldLength SN-FieldLengthAM OPTIONAL, -- Cond Reestab

 t-PollRetransmit T-PollRetransmit,

 pollPDU PollPDU,

 pollByte PollByte,

 maxRetxThreshold ENUMERATED { t1, t2, t3, t4, t6, t8, t16, t32 }

}

DL-AM-RLC ::= SEQUENCE {

 sn-FieldLength SN-FieldLengthAM OPTIONAL, -- Cond Reestab

 t-Reassembly T-Reassembly,

 t-StatusProhibit T-StatusProhibit

}

UL-UM-RLC ::= SEQUENCE {

 sn-FieldLength SN-FieldLengthUM OPTIONAL -- Cond Reestab

}

DL-UM-RLC ::= SEQUENCE {

 sn-FieldLength SN-FieldLengthUM OPTIONAL, -- Cond Reestab

 t-Reassembly T-Reassembly

}

T-PollRetransmit ::= ENUMERATED {

 ms5, ms10, ms15, ms20, ms25, ms30, ms35,

 ms40, ms45, ms50, ms55, ms60, ms65, ms70,

 ms75, ms80, ms85, ms90, ms95, ms100, ms105,

 ms110, ms115, ms120, ms125, ms130, ms135,

 ms140, ms145, ms150, ms155, ms160, ms165,

 ms170, ms175, ms180, ms185, ms190, ms195,

 ms200, ms205, ms210, ms215, ms220, ms225,

 ms230, ms235, ms240, ms245, ms250, ms300,

 ms350, ms400, ms450, ms500, ms800, ms1000,

 ms2000, ms4000, ms1-v1610, ms2-v1610, ms3-v1610,

 ms4-v1610, spare1}

PollPDU ::= ENUMERATED {

 p4, p8, p16, p32, p64, p128, p256, p512, p1024, p2048, p4096, p6144, p8192, p12288, p16384,p20480,

 p24576, p28672, p32768, p40960, p49152, p57344, p65536, infinity, spare8, spare7, spare6, spare5, spare4,

 spare3, spare2, spare1}

PollByte ::= ENUMERATED {

 kB1, kB2, kB5, kB8, kB10, kB15, kB25, kB50, kB75,

 kB100, kB125, kB250, kB375, kB500, kB750, kB1000,

 kB1250, kB1500, kB2000, kB3000, kB4000, kB4500,

 kB5000, kB5500, kB6000, kB6500, kB7000, kB7500,

 mB8, mB9, mB10, mB11, mB12, mB13, mB14, mB15,

 mB16, mB17, mB18, mB20, mB25, mB30, mB40, infinity,

 spare20, spare19, spare18, spare17, spare16,

 spare15, spare14, spare13, spare12, spare11,

 spare10, spare9, spare8, spare7, spare6, spare5,

 spare4, spare3, spare2, spare1}

T-Reassembly ::= ENUMERATED {

 ms0, ms5, ms10, ms15, ms20, ms25, ms30, ms35,

 ms40, ms45, ms50, ms55, ms60, ms65, ms70,

 ms75, ms80, ms85, ms90, ms95, ms100, ms110,

 ms120, ms130, ms140, ms150, ms160, ms170,

 ms180, ms190, ms200, spare1}

T-StatusProhibit ::= ENUMERATED {

 ms0, ms5, ms10, ms15, ms20, ms25, ms30, ms35,

 ms40, ms45, ms50, ms55, ms60, ms65, ms70,

 ms75, ms80, ms85, ms90, ms95, ms100, ms105,

 ms110, ms115, ms120, ms125, ms130, ms135,

 ms140, ms145, ms150, ms155, ms160, ms165,

 ms170, ms175, ms180, ms185, ms190, ms195,

 ms200, ms205, ms210, ms215, ms220, ms225,

 ms230, ms235, ms240, ms245, ms250, ms300,

 ms350, ms400, ms450, ms500, ms800, ms1000,

 ms1200, ms1600, ms2000, ms2400, spare2, spare1}

SN-FieldLengthUM ::= ENUMERATED {size6, size12}

SN-FieldLengthAM ::= ENUMERATED {size12, size18}

RLC-Config-v1610 ::= SEQUENCE {

 dl-AM-RLC-v1610 DL-AM-RLC-v1610

}

RLC-Config-v1700 ::= SEQUENCE {

 dl-AM-RLC-v1700 DL-AM-RLC-v1700,

 dl-UM-RLC-v1700 DL-UM-RLC-v1700

}

RLC-Config-v19xy ::= SEQUENCE {

 dl-AM-RLC-v19xy DL-AM-RLC-v19xy,

 ul-AM-RLC-v19xy UL-AM-RLC-v19xy

}

DL-AM-RLC-v1610 ::= SEQUENCE {

 t-StatusProhibit-v1610 T-StatusProhibit-v1610 OPTIONAL, -- Need R

 ...

}

DL-AM-RLC-v1700 ::= SEQUENCE {

 t-ReassemblyExt-r17 T-ReassemblyExt-r17 OPTIONAL -- Need R

}

DL-AM-RLC-v19xy ::= SEQUENCE {

 t-RxDiscard-r19 T-RxDiscard-r19

}

UL-AM-RLC-v19xy ::= SEQUENCE {

 stopReTxObsoleteSDU-r19 ENUMERATED {enabled, disabled},

 autonomousReTxThreshold-r19 AutonomousReTxThreshold-r19 OPTIONAL, -- Need R

 enhancedPollingThreshold-r19 EnhancedPollingThreshold-r19 OPTIONAL -- Need R

}

DL-UM-RLC-v1700 ::= SEQUENCE {

 t-ReassemblyExt-r17 T-ReassemblyExt-r17 OPTIONAL -- Need R

}

AutonomousReTxThreshold-r19 ::= INTEGER (1..64)

EnhancedPollingThreshold-r19 ::= INTEGER (1..64)

T-StatusProhibit-v1610 ::= ENUMERATED { ms1, ms2, ms3, ms4, spare4, spare3, spare2, spare1}

T-ReassemblyExt-r17 ::= ENUMERATED {ms210, ms220, ms340, ms350, ms550, ms1100, ms1650, ms2200}

T-RxDiscard-r19 ::= ENUMERATED {ms10, ms20, ms30, ms40, ms50, ms60, ms75, ms100, ms150, ms200,

 ms250, ms300, ms500, ms750, ms1500, ms3000}

-- TAG-RLC-CONFIG-STOP

-- ASN1STOP

| ***RLC-Config* field descriptions** |
| --- |
| ***autonomousReTxTreshold***Remaining time threshold that when the remaining time of a RLC SDU falls below the threshold, the Tx side of the RLC entity triggers autonomous retransmission as specified in TS 38.322 [4]. Value for the IE *AutonomousReTxThreshold* in number of milliseconds.Editor's NOTE: There is an FFS in the last meeting on how the remaining time is determined: FFS if remaining time is determined based on discardTimer at PDCP or new timer at RLC. The definition of remaining time can be further discussed based on this. |
| ***enhancedPollingTheshold***Remaining time threshold that when the remaining time of a RLC SDU falls below the threshold, the Tx side of the RLC entity triggers polling as specified in TS 38.322 [4]. Value for the IE *enhancedPollingThreshold* in number of milliseconds.Edtior’s NOTE: Same note as above. |
| ***maxRetxThreshold***Parameter for RLC AM in TS 38.322 [4]. Value *t1* corresponds to 1 retransmission, value *t2* corresponds to 2 retransmissions and so on. |
| ***pollByte***Parameter for RLC AM in TS 38.322 [4]. Value *kB25* corresponds to 25 kBytes, value *kB50* corresponds to 50 kBytes and so on. *infinity* corresponds to an infinite amount of kBytes. |
| ***pollPDU***Parameter for RLC AM in TS 38.322 [4]. Value *p4* corresponds to 4 PDUs, value *p8* corresponds to 8 PDUs and so on. *infinity* corresponds to an infinite number of PDUs. |
| ***sn-FieldLength***Indicates the RLC SN field size, see TS 38.322 [4], in bits. Value *size6* means 6 bits, value *size12* means 12 bits, value *size18* means 18 bits. The value of *sn-FieldLength* of an RLC entity for the DRB/multicast MRB shall be changed only using reconfiguration with sync. The network configures only value *size12* in *SN-FieldLengthAM* for SRB. |
| ***stopReTxObsoleteSDU***Indicates whether the Tx side should stop RLC retransmission of SDUs whose corresponding PDCP discard timer has already expired in the PDCP layer.  |
| ***t-RxDiscard***Timer for the RLC SDU discard at the receiving side, see TS 38.322 [4]. Value *ms10* means 10 milliseconds, value *20ms* means 20 milliseconds, and so on. The value of the field should not be lower than that configured by the field *t-Reassembly*. |
| ***t-PollRetransmit***Timer for RLC AM in TS 38.322 [4], in milliseconds. Value *ms5* means 5 ms, value *ms10* means 10 ms and so on. |
| ***t-Reassembly, t-ReassemblyExt***Timer for reassembly in TS 38.322 [4], in milliseconds. Value *ms0* means 0 ms, value *ms5* means 5 ms and so on. If *t-ReassemblyExt-r17* is configured, the UE shall ignore *t-Reassembly* (without suffix). |
| ***t-StatusProhibit***Timer for status reporting in TS 38.322 [4], in milliseconds. Value *ms0* means 0 ms, value *ms5* means 5 ms and so on. If *t-StatusProhibit-v1610* is present, the UE shall ignore *t-StatusProhibit* (without suffix). |

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *Reestab* | The field is mandatory present at RLC bearer setup. It is optionally present, need M, at RLC re-establishment. Otherwise it is absent. Need M. |

==========================================================NEXT CHANGE=======================================================

6.4 RRC multiplicity and type constraint values

– Multiplicity and type constraint definitions

-- ASN1START

-- TAG-MULTIPLICITY-AND-TYPE-CONSTRAINT-DEFINITIONS-START

maxAdditionalRACH-r17 INTEGER ::= 256 -- Maximum number of additional RACH configurations.

maxAI-DCI-PayloadSize-r16 INTEGER ::= 128 --Maximum size of the DCI payload scrambled with ai-RNTI

maxAI-DCI-PayloadSize-1-r16 INTEGER ::= 127 --Maximum size of the DCI payload scrambled with ai-RNTI minus 1

maxBandComb INTEGER ::= 65536 -- Maximum number of DL band combinations

maxBandComb-MUSIM-r18 INTEGER ::= 64 -- Maximum number of MUSIM bands and/or band combinations

maxBandsUTRA-FDD-r16 INTEGER ::= 64 -- Maximum number of bands listed in UTRA-FDD UE caps

maxCandidateBandIndex-r18 INTEGER ::= 8 -- Maximum number of band entry index for MUSIM capability

maxBH-RLC-ChannelID-r16 INTEGER ::= 65536 -- Maximum value of BH RLC Channel ID

maxBT-IdReport-r16 INTEGER ::= 32 -- Maximum number of Bluetooth IDs to report

maxBT-Name-r16 INTEGER ::= 4 -- Maximum number of Bluetooth name

maxCAG-Cell-r16 INTEGER ::= 16 -- Maximum number of NR CAG cell ranges in SIB3, SIB4

maxTwoPUCCH-Grp-ConfigList-r16 INTEGER ::= 32 -- Maximum number of supported configuration(s) of {primary PUCCH group

 -- config, secondary PUCCH group config}

maxTwoPUCCH-Grp-ConfigList-r17 INTEGER ::= 16 -- Maximum number of supported configuration(s) of {primary PUCCH group

 -- config, secondary PUCCH group config} for PUCCH cell switching

maxCBR-Config-r16 INTEGER ::= 8 -- Maximum number of CBR range configurations for sidelink communication

 -- congestion control

maxCBR-Config-1-r16 INTEGER ::= 7 -- Maximum number of CBR range configurations for sidelink communication

 -- congestion control minus 1

maxCBR-Level-r16 INTEGER ::= 16 -- Maximum number of CBR levels

maxCBR-Level-1-r16 INTEGER ::= 15 -- Maximum number of CBR levels minus 1

maxCellATG-r18 INTEGER ::= 8 -- Maximum number of ATG neighbour cells for which assistance information is

 -- provided

maxCellExcluded INTEGER ::= 16 -- Maximum number of NR exclude-listed cell ranges in SIB3, SIB4

maxCellGroupings-r16 INTEGER ::= 32 -- Maximum number of cell groupings for NR-DC

maxCellHistory-r16 INTEGER ::= 16 -- Maximum number of visited PCells reported

maxPSCellHistory-r17 INTEGER ::= 16 -- Maximum number of visited PSCells across all reported PCells

maxCellInter INTEGER ::= 16 -- Maximum number of inter-Freq cells listed in SIB4

maxCellIntra INTEGER ::= 16 -- Maximum number of intra-Freq cells listed in SIB3

maxCellMeasEUTRA INTEGER ::= 32 -- Maximum number of cells in E-UTRAN

maxCellMeasIdle-r16 INTEGER ::= 8 -- Maximum number of cells per carrier for idle/inactive measurements

maxCellMeasUTRA-FDD-r16 INTEGER ::= 32 -- Maximum number of cells in FDD UTRAN

maxCellNTN-r17 INTEGER ::= 4 -- Maximum number of NTN neighbour cells for which assistance information is

 -- provided

maxCarrierTypePairList-r16 INTEGER ::= 16 -- Maximum number of supported carrier type pair of (carrier type on which

 -- CSI measurement is performed, carrier type on which CSI reporting is

 -- performed) for CSI reporting cross PUCCH group

maxCellAllowed INTEGER ::= 16 -- Maximum number of NR allow-listed cell ranges in SIB3, SIB4

maxDSR-ReportingThres-r19 INTEGER ::= 4 -- Maximum number of DSR reporting threshold configurable for enhanced DSR with

 -- multiple remaining time

-- Editor's NOTE: FFS the maximum value for the number of DSR reproting thresholds. Current value for a placeholder

maxEARFCN INTEGER ::= 262143 -- Maximum value of E-UTRA carrier frequency

maxEUTRA-CellExcluded INTEGER ::= 16 -- Maximum number of E-UTRA exclude-listed physical cell identity ranges

 -- in SIB5

maxEUTRA-NS-Pmax INTEGER ::= 8 -- Maximum number of NS and P-Max values per band

maxFeatureCombPreamblesPerRACHResource-r17 INTEGER ::= 256 -- Maximum number of feature combination preambles.

maxLogMeasReport-r16 INTEGER ::= 520 -- Maximum number of entries for logged measurements

maxMultiBands INTEGER ::= 8 -- Maximum number of additional frequency bands that a cell belongs to

maxNARFCN INTEGER ::= 3279165 -- Maximum value of NR carrier frequency

maxNR-NS-Pmax INTEGER ::= 8 -- Maximum number of NS and P-Max values per band

maxFreqIdle-r16 INTEGER ::= 8 -- Maximum number of carrier frequencies for idle/inactive measurements

maxNrofServingCells INTEGER ::= 32 -- Max number of serving cells (SpCells + SCells)

maxNrofServingCells-1 INTEGER ::= 31 -- Max number of serving cells (SpCells + SCells) minus 1

maxNrofAggregatedCellsPerCellGroup INTEGER ::= 16

maxNrofAggregatedCellsPerCellGroupMinus4-r16 INTEGER ::= 12

maxNrofAperiodicFwdTimeResource-r18 INTEGER ::= 112 -- Max number of aperiodic fowarding time resources for NCR

maxNrofAperiodicFwdTimeResource-1-r18 INTEGER ::= 111 -- Max number of aperiodic fowarding time resources for NCR minus 1

maxNrofDUCells-r16 INTEGER ::= 512 -- Max number of cells configured on the collocated IAB-DU

maxNrofAppLayerMeas-r17 INTEGER ::= 16 -- Max number of simultaneous application layer measurements

maxNrofAppLayerMeas-1-r17 INTEGER ::= 15 -- Max number of simultaneous application layer measurements minus 1

maxNrofAppLayerReports-r18 INTEGER ::= 16 -- Max number of application layer measurement reports with the same

 -- measConfigAppLayerId included in the same

 -- MeasurementReportAppLayerMessage

maxNrofAvailabilityCombinationsPerSet-r16 INTEGER ::= 512 -- Max number of AvailabilityCombinationId used in the DCI format 2\_5

maxNrofAvailabilityCombinationsPerSet-1-r16 INTEGER ::= 511 -- Max number of AvailabilityCombinationId used in the DCI format 2\_5 minus 1

maxNrofIABResourceConfig-r17 INTEGER ::= 65536 -- Max number of IAB-ResourceConfigID used in MAC CE

maxNrofIABResourceConfig-1-r17 INTEGER ::= 65535 -- Max number of IAB-ResourceConfigID used in MAC CE minus 1

maxNrofPeriodicFwdResourceSet-r18 INTEGER ::= 32 -- Max number of periodic fowarding resource sets for NCR

maxNrofPeriodicFwdResourceSet-1-r18 INTEGER ::= 31 -- Max number of periodic fowarding resource sets for NCR minus 1

maxNrofPeriodicFwdResource-r18 INTEGER ::= 1024 -- Max number of periodic fowarding resources for NCR

maxNrofPeriodicFwdResource-1-r18 INTEGER ::= 1023 -- Max number of periodic fowarding resources for NCR minus 1

maxNrofSemiPersistentFwdResourceSet-r18 INTEGER ::= 32 -- Max number of semi-persistent fowarding resource sets for NCR

maxNrofSemiPersistentFwdResourceSet-1-r18 INTEGER ::= 31 -- Max number of semi-persistent fowarding resource sets for NCR minus 1

maxNrofSemiPersistentFwdResource-r18 INTEGER ::= 128 -- Max number of semi-persistent fowarding resources for NCR

maxNrofSemiPersistentFwdResource-1-r18 INTEGER ::= 127 -- Max number of semi-persistent fowarding resources for NCR minus 1

maxNrofSCellActRS-r17 INTEGER ::= 255 -- Max number of RS configurations per SCell for SCell activation

maxNrofSCells INTEGER ::= 31 -- Max number of secondary serving cells per cell group

maxNrofCellMeas INTEGER ::= 32 -- Maximum number of entries in each of the cell lists in a measurement object

maxNrofCRS-IM-InterfCell-r17 INTEGER ::= 8 -- Maximum number of LTE interference cells for CRS-IM per UE

maxNrofRelayMeas-r17 INTEGER ::= 32 -- Maximum number of L2 U2N Relay UEs to measure for each measurement object

 -- on sidelink frequency

maxNrofCG-SL-r16 INTEGER ::= 8 -- Max number of sidelink configured grant

maxNrofCG-SL-1-r16 INTEGER ::= 7 -- Max number of sidelink configured grant minus 1

maxSL-GC-BC-DRX-QoS-r17 INTEGER ::= 16 -- Max number of sidelink DRX configurations for NR

 -- sidelink groupcast/broadcast communication

maxNrofSL-RxInfoSet-r17 INTEGER ::= 4 -- Max number of sidelink DRX configuration sets in sidelink DRX assistant

 -- information

maxNrofSS-BlocksToAverage INTEGER ::= 16 -- Max number for the (max) number of SS blocks to average to determine cell measurement

maxNrofCondCells-r16 INTEGER ::= 8 -- Max number of conditional candidate SpCells

maxNrofCondCells-1-r17 INTEGER ::= 7 -- Max number of conditional candidate SpCells minus 1

maxNrofCSI-RS-ResourcesToAverage INTEGER ::= 16 -- Max number for the (max) number of CSI-RS to average to determine cell measurement

maxNrofDL-Allocations INTEGER ::= 16 -- Maximum number of PDSCH time domain resource allocations

maxNrofDL-AllocationsExt-r17 INTEGER ::= 64 -- Maximum number of PDSCH time domain resource allocations for multi-PDSCH

 -- scheduling

maxNrofDL-Allocations-1-r18 INTEGER ::= 15 -- Maximum number of PDSCH time domain resource allocations minus 1

maxNrofPDU-Sessions-r17 INTEGER ::= 256 -- Maximum number of PDU Sessions

maxNrofSR-ConfigPerCellGroup INTEGER ::= 8 -- Maximum number of SR configurations per cell group

maxNrofLCGs-r18 INTEGER ::= 8 -- Maximum number of LCGs

maxLCG-ID INTEGER ::= 7 -- Maximum value of LCG ID

maxLCG-ID-IAB-r17 INTEGER ::= 255 -- Maximum value of LCG ID for IAB-MT

maxLC-ID INTEGER ::= 32 -- Maximum value of Logical Channel ID

maxLC-ID-Iab-r16 INTEGER ::= 65855 -- Maximum value of BH Logical Channel ID extension

maxLTE-CRS-Patterns-r16 INTEGER ::= 3 -- Maximum number of additional LTE CRS rate matching patterns

maxNrOfLinkedSRS-CarriersInactive-1-r18 INTEGER ::= 2 -- Maximum number of carriers for positioning SRS CA in RRC\_INACTIVE minus 1

maxNrofTAGs INTEGER ::= 4 -- Maximum number of Timing Advance Groups

maxNrofTAGs-1 INTEGER ::= 3 -- Maximum number of Timing Advance Groups minus 1

maxNrofBWPs INTEGER ::= 4 -- Maximum number of BWPs per serving cell

maxNrofCombIDC INTEGER ::= 128 -- Maximum number of reported MR-DC combinations for IDC

maxNrofSymbols-1 INTEGER ::= 13 -- Maximum index identifying a symbol within a slot (14 symbols, indexed from 0..13)

maxNrofSlots INTEGER ::= 320 -- Maximum number of slots in a 10 ms period

maxNrofSlots-1 INTEGER ::= 319 -- Maximum number of slots in a 10 ms period minus 1

maxNrofPhysicalResourceBlocks INTEGER ::= 275 -- Maximum number of PRBs

maxNrofPhysicalResourceBlocks-1 INTEGER ::= 274 -- Maximum number of PRBs minus 1

maxNrofPhysicalResourceBlocksPlus1 INTEGER ::= 276 -- Maximum number of PRBs plus 1

maxNrofControlResourceSets INTEGER ::= 12 -- Max number of CoReSets configurable on a serving cell

maxNrofControlResourceSets-1 INTEGER ::= 11 -- Max number of CoReSets configurable on a serving cell minus 1

maxNrofControlResourceSets-1-r16 INTEGER ::= 15 -- Max number of CoReSets configurable on a serving cell extended in minus 1

maxNrofCoresetPools-r16 INTEGER ::= 2 -- Maximum number of CORESET pools

maxCoReSetDuration INTEGER ::= 3 -- Max number of OFDM symbols in a control resource set

maxNrofSearchSpaces-1 INTEGER ::= 39 -- Max number of Search Spaces minus 1

maxNrofSearchSpacesLinks-1-r17 INTEGER ::= 39 -- Max number of Search Space links minus 1

maxNrofBFDResourcePerSet-r17 INTEGER ::= 64 -- Max number of reference signal in one BFD set

maxSFI-DCI-PayloadSize INTEGER ::= 128 -- Max number payload of a DCI scrambled with SFI-RNTI

maxSFI-DCI-PayloadSize-1 INTEGER ::= 127 -- Max number payload of a DCI scrambled with SFI-RNTI minus 1

maxIAB-IP-Address-r16 INTEGER ::= 32 -- Max number of assigned IP addresses

maxINT-DCI-PayloadSize INTEGER ::= 126 -- Max number payload of a DCI scrambled with INT-RNTI

maxINT-DCI-PayloadSize-1 INTEGER ::= 125 -- Max number payload of a DCI scrambled with INT-RNTI minus 1

maxNrofRateMatchPatterns INTEGER ::= 4 -- Max number of rate matching patterns that may be configured

maxNrofRateMatchPatterns-1 INTEGER ::= 3 -- Max number of rate matching patterns that may be configured minus 1

maxNrofRateMatchPatternsPerGroup INTEGER ::= 8 -- Max number of rate matching patterns that may be configured in one group

maxNrofCSI-ReportConfigurations INTEGER ::= 48 -- Maximum number of report configurations

maxNrofCSI-ReportConfigurations-1 INTEGER ::= 47 -- Maximum number of report configurations minus 1

maxNrofCSI-ResourceConfigurations INTEGER ::= 112 -- Maximum number of resource configurations

maxNrofCSI-ResourceConfigurations-1 INTEGER ::= 111 -- Maximum number of resource configurations minus 1

maxNrofAP-CSI-RS-ResourcesPerSet INTEGER ::= 16

maxNrOfCSI-AperiodicTriggers INTEGER ::= 128 -- Maximum number of triggers for aperiodic CSI reporting

maxNrofReportConfigPerAperiodicTrigger INTEGER ::= 16 -- Maximum number of report configurations per trigger state for aperiodic reporting

maxNrofNZP-CSI-RS-Resources INTEGER ::= 192 -- Maximum number of Non-Zero-Power (NZP) CSI-RS resources

maxNrofNZP-CSI-RS-Resources-1 INTEGER ::= 191 -- Maximum number of Non-Zero-Power (NZP) CSI-RS resources minus 1

maxNrofNZP-CSI-RS-ResourcesPerSet INTEGER ::= 64 -- Maximum number of NZP CSI-RS resources per resource set

maxNrofNZP-CSI-RS-ResourcesPerSet-1-r18 INTEGER ::= 63 -- Maximum number of NZP CSI-RS resources per resource set minus 1

maxNrofNZP-CSI-RS-ResourceSets INTEGER ::= 64 -- Maximum number of NZP CSI-RS resource sets per cell

maxNrofNZP-CSI-RS-ResourceSets-1 INTEGER ::= 63 -- Maximum number of NZP CSI-RS resource sets per cell minus 1

maxNrofNZP-CSI-RS-ResourceSetsPerConfig INTEGER ::= 16 -- Maximum number of resource sets per resource configuration

maxNrofNZP-CSI-RS-ResourcesPerConfig INTEGER ::= 128 -- Maximum number of resources per resource configuration

maxNrofZP-CSI-RS-Resources INTEGER ::= 32 -- Maximum number of Zero-Power (ZP) CSI-RS resources

maxNrofZP-CSI-RS-Resources-1 INTEGER ::= 31 -- Maximum number of Zero-Power (ZP) CSI-RS resources minus 1

maxNrofZP-CSI-RS-ResourceSets-1 INTEGER ::= 15

maxNrofZP-CSI-RS-ResourcesPerSet INTEGER ::= 16

maxNrofZP-CSI-RS-ResourceSets INTEGER ::= 16

maxNrofCSI-IM-Resources INTEGER ::= 32 -- Maximum number of CSI-IM resources

maxNrofCSI-IM-Resources-1 INTEGER ::= 31 -- Maximum number of CSI-IM resources minus 1

maxNrofCSI-IM-ResourcesPerSet INTEGER ::= 8 -- Maximum number of CSI-IM resources per set

maxNrofCSI-IM-ResourceSets INTEGER ::= 64 -- Maximum number of NZP CSI-IM resource sets per cell

maxNrofCSI-IM-ResourceSets-1 INTEGER ::= 63 -- Maximum number of NZP CSI-IM resource sets per cell minus 1

maxNrofCSI-IM-ResourceSetsPerConfig INTEGER ::= 16 -- Maximum number of CSI IM resource sets per resource configuration

maxNrofCSI-SSB-ResourcePerSet INTEGER ::= 64 -- Maximum number of SSB resources in a resource set

maxNrofCSI-SSB-ResourceSets INTEGER ::= 64 -- Maximum number of CSI SSB resource sets per cell

maxNrofCSI-SSB-ResourceSets-1 INTEGER ::= 63 -- Maximum number of CSI SSB resource sets per cell minus 1

maxNrofCSI-SSB-ResourceSetsPerConfig INTEGER ::= 1 -- Maximum number of CSI SSB resource sets per resource configuration

maxNrofCSI-SSB-ResourceSetsPerConfigExt INTEGER ::= 2 -- Maximum number of CSI SSB resource sets per resource configuration

 -- extended

maxNrofFailureDetectionResources INTEGER ::= 10 -- Maximum number of failure detection resources

maxNrofFailureDetectionResources-1 INTEGER ::= 9 -- Maximum number of failure detection resources minus 1

maxNrofFailureDetectionResources-1-r17 INTEGER ::= 63 -- Maximum number of the enhanced failure detection resources minus 1

maxNrofFreqSL-r16 INTEGER ::= 8 -- Maximum number of carrier frequency for NR sidelink communication

maxNrofFreqSL-1-r18 INTEGER ::= 7 -- Maximum number of carrier frequency for NR sidelink communication minus 1

maxNrofSL-BWPs-r16 INTEGER ::= 4 -- Maximum number of BWP for NR sidelink communication

maxNrofSL-CarrierSetConfig-r18 INTEGER ::= 96 -- Maximum number of SCCH carrier set configuration for NR sidelink

 -- communication

maxFreqSL-EUTRA-r16 INTEGER ::= 8 -- Maximum number of EUTRA anchor carrier frequency for NR sidelink

 -- communication

maxNrofSL-MeasId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement identity (RSRP) per destination

maxNrofSL-ObjectId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement objects (RSRP) per destination

maxNrofSL-ReportConfigId-r16 INTEGER ::= 64 -- Maximum number of sidelink measurement reporting configuration(RSRP) per destination

maxNrofSL-PoolToMeasureNR-r16 INTEGER ::= 8 -- Maximum number of resource pool for NR sidelink measurement to measure

 -- for each measurement object (for CBR)

maxNrofDedicatedSL-PRS-PoolToMeas-r18 INTEGER ::= 8 -- Maximum number of SL-PRS dedicated resource pool for positioning

 -- measurement to measure for each measurement object (for SL-PRS CBR)

maxFreqSL-NR-r16 INTEGER ::= 8 -- Maximum number of NR anchor carrier frequency for NR sidelink communication

maxNrofSL-QFIs-r16 INTEGER ::= 2048 -- Maximum number of QoS flow for NR sidelink communication per UE

maxNrofSL-QFIsPerDest-r16 INTEGER ::= 64 -- Maximum number of QoS flow per destination for NR sidelink communication

maxNrofObjectId INTEGER ::= 64 -- Maximum number of measurement objects

maxNrofPageRec INTEGER ::= 32 -- Maximum number of page records

maxNrofPCI-Ranges INTEGER ::= 8 -- Maximum number of PCI ranges

maxPLMN INTEGER ::= 12 -- Maximum number of PLMNs broadcast and reported by UE at establishment

maxTAC-r17 INTEGER ::= 12 -- Maximum number of Tracking Area Codes to which a cell belongs to

maxNrofCSI-RS-ResourcesRRM INTEGER ::= 96 -- Maximum number of CSI-RS resources per cell for an RRM measurement object

maxNrofCSI-RS-ResourcesRRM-1 INTEGER ::= 95 -- Maximum number of CSI-RS resources per cell for an RRM measurement object

 -- minus 1.

maxNrofMeasId INTEGER ::= 64 -- Maximum number of configured measurements

maxNrofQuantityConfig INTEGER ::= 2 -- Maximum number of quantity configurations

maxNrofCSI-RS-CellsRRM INTEGER ::= 96 -- Maximum number of cells with CSI-RS resources for an RRM measurement object

maxNrofSL-Dest-r16 INTEGER ::= 32 -- Maximum number of destination for NR sidelink communication and discovery

maxNrofSL-Dest-1-r16 INTEGER ::= 31 -- Highest index of destination for NR sidelink communication and discovery

maxNrofSL-PRS-PerDest-r18 INTEGER ::= 8 -- Max number of SL-PRS transmission supported per destination UE

maxNrofSLRB-r16 INTEGER ::= 512 -- Maximum number of radio bearer for NR sidelink communication per UE without duplication

maxSL-LCID-Plus1-r18 INTEGER ::= 513 -- Maximum number of RLC bearer for NR sidelink communication per UE without duplication plus 1

maxSL-LCID-r18 INTEGER ::= 1024 -- Maximum number of RLC bearer for NR sidelink communication per UE with duplication

maxSL-NonAnchorRBsets INTEGER ::= 4 -- Maximum number of non-anchor RB sets

maxSL-LCID-r16 INTEGER ::= 512 -- Maximum number of RLC bearer for NR sidelink communication per UE

maxSL-SyncConfig-r16 INTEGER ::= 16 -- Maximum number of sidelink Sync configurations

maxNrofRXPool-r16 INTEGER ::= 16 -- Maximum number of Rx resource pool for NR sidelink communication and

 -- discovery

maxNrofTXPool-r16 INTEGER ::= 8 -- Maximum number of Tx resource pool for NR sidelink communication and

 -- discovery

maxNrofPoolID-r16 INTEGER ::= 16 -- Maximum index of resource pool for NR sidelink communication and

 -- discovery

maxNrofSRS-PathlossReferenceRS-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for SRS power control.

maxNrofSRS-PathlossReferenceRS-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for SRS power control

 -- minus 1.

maxNrofSRS-ResourceSets INTEGER ::= 16 -- Maximum number of SRS resource sets in a BWP.

maxNrofSRS-ResourceSets-1 INTEGER ::= 15 -- Maximum number of SRS resource sets in a BWP minus 1.

maxNrofSRS-PosResourceSets-r16 INTEGER ::= 16 -- Maximum number of SRS Positioning resource sets in a BWP.

maxNrofSRS-PosResourceSets-1-r16 INTEGER ::= 15 -- Maximum number of SRS Positioning resource sets in a BWP minus 1.

maxNrofSRS-Resources INTEGER ::= 64 -- Maximum number of SRS resources.

maxNrofSRS-Resources-1 INTEGER ::= 63 -- Maximum number of SRS resources minus 1.

maxNrofSRS-PosResources-r16 INTEGER ::= 64 -- Maximum number of SRS Positioning resources.

maxNrofSRS-PosResources-1-r16 INTEGER ::= 63 -- Maximum number of SRS Positioning resources minus 1.

maxNrofSRS-ResourcesPerSet INTEGER ::= 16 -- Maximum number of SRS resources in an SRS resource set

maxNrofSRS-TriggerStates-1 INTEGER ::= 3 -- Maximum number of SRS trigger states minus 1, i.e., the largest code point.

maxNrofSRS-TriggerStates-2 INTEGER ::= 2 -- Maximum number of SRS trigger states minus 2.

maxRAT-CapabilityContainers INTEGER ::= 8 -- Maximum number of interworking RAT containers (incl NR and MRDC)

maxSimultaneousBands INTEGER ::= 32 -- Maximum number of simultaneously aggregated bands

maxSimultaneousBands-2-r18 INTEGER ::= 30 -- Maximum number of simultaneously aggregated bands minus 2.

maxULTxSwitchingBandPairs INTEGER ::= 32 -- Maximum number of band pairs supporting dynamic UL Tx switching in a band

 -- combination.

maxULTxSwitchingBetweenBandPairs-r18 INTEGER ::= 32 -- Maximum number of combinations of a band pair and another band pair/band

 -- between which dynamic UL Tx switching requires additional switching

 -- period.

maxSchedulingBandCombination-r18 INTEGER ::= 32 -- Maximum number of combinations of scheduling cell and co-scheduled cells

 -- have same or different carrier type.

maxNrofSlotFormatCombinationsPerSet INTEGER ::= 512 -- Maximum number of Slot Format Combinations in a SF-Set.

maxNrofSlotFormatCombinationsPerSet-1 INTEGER ::= 511 -- Maximum number of Slot Format Combinations in a SF-Set minus 1.

maxNrofTrafficPattern-r16 INTEGER ::= 8 -- Maximum number of Traffic Pattern for NR sidelink communication.

maxNrofPUCCH-Resources INTEGER ::= 128

maxNrofPUCCH-Resources-1 INTEGER ::= 127

maxNrofPUCCH-ResourceSets INTEGER ::= 4 -- Maximum number of PUCCH Resource Sets

maxNrofPUCCH-ResourceSets-1 INTEGER ::= 3 -- Maximum number of PUCCH Resource Sets minus 1.

maxNrofPUCCH-ResourcesPerSet INTEGER ::= 32 -- Maximum number of PUCCH Resources per PUCCH-ResourceSet

maxNrofPUCCH-P0-PerSet INTEGER ::= 8 -- Maximum number of P0-pucch present in a p0-pucch set

maxNrofPUCCH-PathlossReferenceRSs INTEGER ::= 4 -- Maximum number of RSs used as pathloss reference for PUCCH power control.

maxNrofPUCCH-PathlossReferenceRSs-1 INTEGER ::= 3 -- Maximum number of RSs used as pathloss reference for PUCCH power control

 -- minus 1.

maxNrofPUCCH-PathlossReferenceRSs-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for PUCCH power control

 -- extended.

maxNrofPUCCH-PathlossReferenceRSs-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for PUCCH power control

 -- minus 1 extended.

maxNrofPUCCH-PathlossReferenceRSs-1-r17 INTEGER ::= 7 -- Maximum number of RSs used as pathloss reference for PUCCH power control

 -- minus 1.

maxNrofPUCCH-PathlossReferenceRSsDiff-r16 INTEGER ::= 60 -- Difference between the extended maximum and the non-extended maximum

maxNrofPUCCH-ResourceGroups-r16 INTEGER ::= 4 -- Maximum number of PUCCH resources groups.

maxNrofPUCCH-ResourcesPerGroup-r16 INTEGER ::= 128 -- Maximum number of PUCCH resources in a PUCCH group.

maxNrofPowerControlSetInfos-r17 INTEGER ::= 8 -- Maximum number of PUCCH power control set infos

maxNrofMultiplePUSCHs-r16 INTEGER ::= 8 -- Maximum number of multiple PUSCHs in PUSCH TDRA list

maxNrofP0-PUSCH-AlphaSets INTEGER ::= 30 -- Maximum number of P0-pusch-alpha-sets (see TS 38.213 [13], clause 7.1)

maxNrofP0-PUSCH-AlphaSets-1 INTEGER ::= 29 -- Maximum number of P0-pusch-alpha-sets minus 1 (see TS 38.213 [13], clause 7.1)

maxNrofPUSCH-PathlossReferenceRSs INTEGER ::= 4 -- Maximum number of RSs used as pathloss reference for PUSCH power control.

maxNrofPUSCH-PathlossReferenceRSs-1 INTEGER ::= 3 -- Maximum number of RSs used as pathloss reference for PUSCH power control

 -- minus 1.

maxNrofPUSCH-PathlossReferenceRSs-r16 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for PUSCH power control

 -- extended

maxNrofPUSCH-PathlossReferenceRSs-1-r16 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for PUSCH power control

 -- extended minus 1

maxNrofPUSCH-PathlossReferenceRSsDiff-r16 INTEGER ::= 60 -- Difference between maxNrofPUSCH-PathlossReferenceRSs-r16 and

 -- maxNrofPUSCH-PathlossReferenceRSs

maxNrofPathlossReferenceRSs-r17 INTEGER ::= 64 -- Maximum number of RSs used as pathloss reference for PUSCH, PUCCH, SRS

 -- power control for unified TCI state operation

maxNrofPathlossReferenceRSs-1-r17 INTEGER ::= 63 -- Maximum number of RSs used as pathloss reference for PUSCH, PUCCH, SRS

 -- power control for unified TCI state operation minus 1

maxNrofNAICS-Entries INTEGER ::= 8 -- Maximum number of supported NAICS capability set

maxBands INTEGER ::= 1024 -- Maximum number of supported bands in UE capability.

maxBandsMRDC INTEGER ::= 1280

maxBandsEUTRA INTEGER ::= 256

maxCellReport INTEGER ::= 8

maxDRB INTEGER ::= 29 -- Maximum number of DRBs (that can be added in DRB-ToAddModList).

maxFreq INTEGER ::= 8 -- Max number of frequencies.

maxFreqLayers INTEGER ::= 4 -- Max number of frequency layers.

maxFreqPlus1 INTEGER ::= 9 -- Max number of frequencies for Slicing.

maxFreqIDC-r16 INTEGER ::= 128 -- Max number of frequencies for IDC indication.

maxCombIDC-r16 INTEGER ::= 128 -- Max number of reported UL CA for IDC indication.

maxFreqIDC-MRDC INTEGER ::= 32 -- Maximum number of candidate NR frequencies for MR-DC IDC indication

maxNrofCandidateBeams INTEGER ::= 16 -- Max number of PRACH-ResourceDedicatedBFR in BFR config.

maxNrofCandidateBeams-r16 INTEGER ::= 64 -- Max number of candidate beam resources in BFR config.

maxNrofCandidateBeamsExt-r16 INTEGER ::= 48 -- Max number of PRACH-ResourceDedicatedBFR in the CandidateBeamRSListExt

maxNrofPCIsPerSMTC INTEGER ::= 64 -- Maximum number of PCIs per SMTC.

maxNrofQFIs INTEGER ::= 64

maxNrofResourceAvailabilityPerCombination-r16 INTEGER ::= 256

maxNrOfSemiPersistentPUSCH-Triggers INTEGER ::= 64 -- Maximum number of triggers for semi persistent reporting on PUSCH

maxNrofSR-Resources INTEGER ::= 8 -- Maximum number of SR resources per BWP in a cell.

maxNrofSlotFormatsPerCombination INTEGER ::= 256

maxNrofSpatialRelationInfos INTEGER ::= 8

maxNrofSpatialRelationInfos-plus-1 INTEGER ::= 9

maxNrofSpatialRelationInfos-r16 INTEGER ::= 64

maxNrofSpatialRelationInfosDiff-r16 INTEGER ::= 56 -- Difference between maxNrofSpatialRelationInfos-r16 and maxNrofSpatialRelationInfos

maxNrofIndexesToReport INTEGER ::= 32

maxNrofIndexesToReport2 INTEGER ::= 64

maxNrofSSBs-r16 INTEGER ::= 64 -- Maximum number of SSB resources in a resource set.

maxNrofSSBs-1 INTEGER ::= 63 -- Maximum number of SSB resources in a resource set minus 1.

maxNrofS-NSSAI INTEGER ::= 8 -- Maximum number of S-NSSAI.

maxNrofTCI-StatesPDCCH INTEGER ::= 64

maxNrofTCI-States INTEGER ::= 128 -- Maximum number of TCI states.

maxNrofTCI-States-1 INTEGER ::= 127 -- Maximum number of TCI states minus 1.

maxUL-TCI-r17 INTEGER ::= 64 -- Maximum number of TCI states.

maxUL-TCI-1-r17 INTEGER ::= 63 -- Maximum number of TCI states minus 1.

maxNrofAdditionalPCI-r17 INTEGER ::= 7 -- Maximum number of additional PCI

maxNrofAdditionalPRACHConfigs-r18 INTEGER ::= 7 -- Maximum number of additional PRACH configurations for 2TA

maxNrofdelayD-r18 INTEGER ::= 4 -- Maximum number of delayD values.

maxMPE-Resources-r17 INTEGER ::= 64 -- Maximum number of pooled MPE resources

maxNrofUL-Allocations INTEGER ::= 16 -- Maximum number of PUSCH time domain resource allocations.

maxQFI INTEGER ::= 63

maxRA-CSIRS-Resources INTEGER ::= 96

maxRA-OccasionsPerCSIRS INTEGER ::= 64 -- Maximum number of RA occasions for one CSI-RS

maxRA-Occasions-1 INTEGER ::= 511 -- Maximum number of RA occasions in the system

maxRA-SSB-Resources INTEGER ::= 64

maxSCSs INTEGER ::= 5

maxSecondaryCellGroups INTEGER ::= 3

maxNrofServingCellsEUTRA INTEGER ::= 32

maxMBSFN-Allocations INTEGER ::= 8

maxNrofMultiBands INTEGER ::= 8

maxCellSFTD INTEGER ::= 3 -- Maximum number of cells for SFTD reporting

maxReportConfigId INTEGER ::= 64

maxNrofCodebooks INTEGER ::= 16 -- Maximum number of codebooks supported by the UE

maxNrofCSI-RS-ResourcesExt-r16 INTEGER ::= 16 -- Maximum number of codebook resources supported by the UE for eType2/Codebook combo

maxNrofCSI-RS-ResourcesExt-r17 INTEGER ::= 8 -- Maximum number of codebook resources for fetype2R1 and fetype2R2

maxNrofCSI-RS-Resources INTEGER ::= 7 -- Maximum number of codebook resources supported by the UE

maxNrofCSI-RS-ResourcesAlt-r16 INTEGER ::= 512 -- Maximum number of alternative codebook resources supported by the UE

maxNrofCSI-RS-ResourcesAlt-1-r16 INTEGER ::= 511 -- Maximum number of alternative codebook resources supported by the UE minus 1

maxNrofSRI-PUSCH-Mappings INTEGER ::= 16

maxNrofSRI-PUSCH-Mappings-1 INTEGER ::= 15

maxSIB INTEGER::= 32 -- Maximum number of SIBs

maxSI-Message INTEGER::= 32 -- Maximum number of SI messages

maxSIB-MessagePlus1-r17 INTEGER::= 33 -- Maximum number of SIB messages plus 1

maxPO-perPF INTEGER ::= 4 -- Maximum number of paging occasion per paging frame

maxPEI-perPF-r17 INTEGER ::= 4 -- Maximum number of PEI occasion per paging frame

maxAccessCat-1 INTEGER ::= 63 -- Maximum number of Access Categories minus 1

maxBarringInfoSet INTEGER ::= 8 -- Maximum number of access control parameter sets

maxCellEUTRA INTEGER ::= 8 -- Maximum number of E-UTRA cells in SIB list

maxEUTRA-Carrier INTEGER ::= 8 -- Maximum number of E-UTRA carriers in SIB list

maxPLMNIdentities INTEGER ::= 8 -- Maximum number of PLMN identities in RAN area configurations

maxDownlinkFeatureSets INTEGER ::= 1024 -- (for NR DL) Total number of FeatureSets (size of the pool)

maxUplinkFeatureSets INTEGER ::= 1024 -- (for NR UL) Total number of FeatureSets (size of the pool)

maxEUTRA-DL-FeatureSets INTEGER ::= 256 -- (for E-UTRA) Total number of FeatureSets (size of the pool)

maxEUTRA-UL-FeatureSets INTEGER ::= 256 -- (for E-UTRA) Total number of FeatureSets (size of the pool)

maxFeatureSetsPerBand INTEGER ::= 128 -- (for NR) The number of feature sets associated with one band.

maxPerCC-FeatureSets INTEGER ::= 1024 -- (for NR) Total number of CC-specific FeatureSets (size of the pool)

maxFeatureSetCombinations INTEGER ::= 1024 -- (for MR-DC/NR)Total number of Feature set combinations (size of the pool)

maxInterRAT-RSTD-Freq INTEGER ::= 3

maxGIN-r17 INTEGER ::= 24 -- Maximum number of broadcast GINs

maxHRNN-Len-r16 INTEGER ::= 48 -- Maximum length of HRNNs

maxNPN-r16 INTEGER ::= 12 -- Maximum number of NPNs broadcast and reported by UE at establishment

maxSNPN-ConfigCellId-r18 INTEGER ::= 32 -- Maximum number of Cell ID subject for SNPNS for MDT scope

maxSNPN-ConfigID-r18 INTEGER ::= 16 -- Maximum number of SNPNs subject for MDT scope

maxSNPN-ConfigTAI-r18 INTEGER ::= 8 -- Maximum number of TA subject for MDT scope

maxNrOfMinSchedulingOffsetValues-r16 INTEGER ::= 2 -- Maximum number of min. scheduling offset (K0/K2) configurations

maxK0-SchedulingOffset-r16 INTEGER ::= 16 -- Maximum number of slots configured as min. scheduling offset (K0)

maxK2-SchedulingOffset-r16 INTEGER ::= 16 -- Maximum number of slots configured as min. scheduling offset (K2)

maxK0-SchedulingOffset-r17 INTEGER ::= 64 -- Maximum number of slots configured as min. scheduling offset (K0)

maxK2-SchedulingOffset-r17 INTEGER ::= 64 -- Maximum number of slots configured as min. scheduling offset (K2)

maxDCI-2-6-Size-r16 INTEGER ::= 140 -- Maximum size of DCI format 2-6

maxDCI-2-7-Size-r17 INTEGER ::= 43 -- Maximum size of DCI format 2-7

maxDCI-2-6-Size-1-r16 INTEGER ::= 139 -- Maximum DCI format 2-6 size minus 1

maxDCI-2-9-Size-r18 INTEGER ::= 140 -- Maximum DCI format 2-9 size

maxDCI-2-9-Size-1-r18 INTEGER ::= 139 -- Maximum DCI format 2-9 size minus 1

maxNrofUL-Allocations-r16 INTEGER ::= 64 -- Maximum number of PUSCH time domain resource allocations

maxNrofUL-Allocations-1-r18 INTEGER ::= 63 -- Maximum number of PUSCH time domain resource allocations minus 1

maxNrofP0-PUSCH-Set-r16 INTEGER ::= 2 -- Maximum number of P0 PUSCH set(s)

maxOnDemandSIB-r16 INTEGER ::= 8 -- Maximum number of SIB(s) that can be requested on-demand

maxOnDemandPosSIB-r16 INTEGER ::= 32 -- Maximum number of posSIB(s) that can be requested on-demand

maxCI-DCI-PayloadSize-r16 INTEGER ::= 126 -- Maximum number of the DCI size for CI

maxCI-DCI-PayloadSize-1-r16 INTEGER ::= 125 -- Maximum number of the DCI size for CI minus 1

maxUu-RelayRLC-ChannelID-r17 INTEGER ::= 32 -- Maximum value of Uu Relay RLC channel ID

maxWLAN-Id-Report-r16 INTEGER ::= 32 -- Maximum number of WLAN IDs to report

maxWLAN-Name-r16 INTEGER ::= 4 -- Maximum number of WLAN name

maxRAReport-r16 INTEGER ::= 8 -- Maximum number of RA procedures information to be included in the RA report

maxTxConfig-r16 INTEGER ::= 64 -- Maximum number of sidelink transmission parameters configurations

maxTxConfig-1-r16 INTEGER ::= 63 -- Maximum number of sidelink transmission parameters configurations minus 1

maxPSSCH-TxConfig-r16 INTEGER ::= 16 -- Maximum number of PSSCH TX configurations

maxNrofCLI-RSSI-Resources-r16 INTEGER ::= 64 -- Maximum number of CLI-RSSI resources for UE

maxNrofCLI-RSSI-Resources-1-r16 INTEGER ::= 63 -- Maximum number of CLI-RSSI resources for UE minus 1

maxNrofCLI-SRS-Resources-r16 INTEGER ::= 32 -- Maximum number of SRS resources for CLI measurement for UE

maxCLI-Report-r16 INTEGER ::= 8

maxNrofCC-Group-r17 INTEGER ::= 16 -- Maximum number of CC groups for DC location report

maxNrofConfiguredGrantConfig-r16 INTEGER ::= 12 -- Maximum number of configured grant configurations per BWP

maxNrofConfiguredGrantConfig-1-r16 INTEGER ::= 11 -- Maximum number of configured grant configurations per BWP minus 1

maxNrofCG-Type2DeactivationState INTEGER ::= 16 -- Maximum number of deactivation state for type 2 configured grants per BWP

maxNrofConfiguredGrantConfigMAC-1-r16 INTEGER ::= 31 -- Maximum number of configured grant configurations per MAC entity minus 1

maxNrofCSI-ReportSubconfigPerCSI-ReportConfig-r18 INTEGER ::= 8 -- Maximum number of CSI report subconfigurations per CSI report

 -- configuration

maxNrofCSI-ReportSubconfigPerCSI-ReportConfig-1-r18 INTEGER ::= 7 -- Maximum number of CSI report subconfigurations per CSI report

 -- configuration minus 1

maxNrofSPS-Config-r16 INTEGER ::= 8 -- Maximum number of SPS configurations per BWP

maxNrofSPS-Config-1-r16 INTEGER ::= 7 -- Maximum number of SPS configurations per BWP minus 1

maxNrofSPS-DeactivationState INTEGER ::= 16 -- Maximum number of deactivation state for SPS per BWP

maxNrofPPW-Config-r17 INTEGER ::= 4 -- Maximum number of Preconfigured PRS processing windows per DL BWP

maxNrofPPW-ID-1-r17 INTEGER ::= 15 -- Maximum number of Preconfigured PRS processing windows minus 1

maxNrOfTxTEGReport-r17 INTEGER ::= 256 -- Maximum number of UE Tx Timing Error Group Report

maxNrOfTxTEG-ID-1-r17 INTEGER ::= 7 -- Maximum number of UE Tx Timing Error Group ID minus 1

maxNrofPagingSubgroups-r17 INTEGER ::= 8 -- Maximum number of paging subgroups per paging occasion

maxNrofPUCCH-ResourceGroups-1-r16 INTEGER ::= 3

maxNrofReqComDC-Location-r17 INTEGER ::= 128 -- Maximum number of requested carriers/BWPs combinations for DC location

 -- report

maxNrofServingCellsTCI-r16 INTEGER ::= 32 -- Maximum number of serving cells in simultaneousTCI-UpdateList

maxNrofTxDC-TwoCarrier-r16 INTEGER ::= 64 -- Maximum number of UL Tx DC locations reported by the UE for 2CC uplink CA

maxNrofRB-SetGroups-r17 INTEGER ::= 8 -- Maximum number of RB set groups

maxNrofRB-Sets-r17 INTEGER ::= 8 -- Maximum number of RB sets

maxNrofEnhType3HARQ-ACK-r17 INTEGER ::= 8 -- Maximum number of enhanced type 3 HARQ-ACK codebook

maxNrofEnhType3HARQ-ACK-1-r17 INTEGER ::= 7 -- Maximum number of enhanced type 3 HARQ-ACK codebook minus 1

maxNrofPRS-ResourcesPerSet-r17 INTEGER ::= 64 -- Maximum number of PRS resources for one set

maxNrofPRS-ResourcesPerSet-1-r17 INTEGER ::= 63 -- Maximum number of PRS resources for one set minus 1

maxNrofPRS-ResourceOffsetValue-1-r17 INTEGER ::= 511

maxNrofGapId-r17 INTEGER ::= 8 -- Maximum number of measurement gap ID

maxNrofPreConfigPosGapId-r17 INTEGER ::= 16 -- Maximum number of preconfigured positioning measurement gap

maxNrOfGapPri-r17 INTEGER ::= 16 -- Maximum number of gap priority level

maxCEFReport-r17 INTEGER ::= 4 -- Maximum number of CEF reports by the UE

maxNrofMultiplePDSCHs-r17 INTEGER ::= 8 -- Maximum number of PDSCHs in PDSCH TDRA list

maxSliceInfo-r17 INTEGER ::= 8 -- Maximum number of NSAGs

maxCellSlice-r17 INTEGER ::= 16 -- Maximum number of cells supporting the NSAG

maxNrofTRS-ResourceSets-r17 INTEGER ::= 64 -- Maximum number of TRS resource sets

maxNrofSearchSpaceGroups-1-r17 INTEGER ::= 2 -- Maximum number of search space groups minus 1

maxNrofRemoteUE-r17 INTEGER ::= 32 -- Maximum number of connected L2 U2N Remote UEs

maxDCI-4-2-Size-r17 INTEGER ::= 140 -- Maximum size of DCI format 4-2

maxFreqMBS-r17 INTEGER ::= 16 -- Maximum number of MBS frequencies reported in MBSInterestIndication

maxNrofDRX-ConfigPTM-r17 INTEGER ::= 64 -- Max number of DRX configuration for PTM provided in MBS broadcast in a

 -- cell

maxNrofDRX-ConfigPTM-1-r17 INTEGER ::= 63 -- Max number of DRX configuration for PTM provided in MBS broadcast in a

 -- cell minus 1

maxNrofMBS-ServiceListPerUE-r17 INTEGER ::= 16 -- Maximum number of services which the UE can include in the MBS interest

 -- indication

maxNrofMBS-Session-r17 INTEGER ::= 1024 -- Maximum number of MBS sessions provided in MBS broadcast or multicast in

 -- a cell

maxNrofMTCH-SSB-MappingWindow-r17 INTEGER ::= 16 -- Maximum number of MTCH to SSB beam mapping pattern

maxNrofMTCH-SSB-MappingWindow-1-r17 INTEGER ::= 15 -- Maximum number of MTCH to SSB beam mapping pattern minus 1

maxNrofMRB-Broadcast-r17 INTEGER ::= 4 -- Maximum number of broadcast MRBs configured for one MBS broadcast service

maxNrofPageGroup-r17 INTEGER ::= 32 -- Maximum number of paging groups in a paging message

maxNrofPDSCH-ConfigPTM-r17 INTEGER ::= 16 -- Maximum number of PDSCH configuration groups for PTM

maxNrofPDSCH-ConfigPTM-1-r17 INTEGER ::= 15 -- Maximum number of PDSCH configuration groups for PTM minus 1

maxG-RNTI-r17 INTEGER ::= 16 -- Maximum number of G-RNTI that can be configured for a UE.

maxG-RNTI-1-r17 INTEGER ::= 15 -- Maximum number of G-RNTI that can be configured for a UE minus 1.

maxG-CS-RNTI-r17 INTEGER ::= 8 -- Maximum number of G-CS-RNTI that can be configured for a UE.

maxG-CS-RNTI-1-r17 INTEGER ::= 7 -- Maximum number of G-CS-RNTI that can be configured for a UE minus 1.

maxMRB-r17 INTEGER ::= 32 -- Maximum number of multicast MRBs (that can be added in MRB-ToAddModLIst)

maxFSAI-MBS-r17 INTEGER ::= 64 -- Maximum number of MBS frequency selection area identities

maxNeighCellMBS-r17 INTEGER ::= 8 -- Maximum number of MBS broadcast neighbour cells

maxNrofPdcch-BlindDetectionMixed-1-r16 INTEGER ::= 7 -- Maximum number of combinations of mixed Rel-16 and Rel-15 PDCCH

 -- monitoring capabilities minus 1

maxNrofPdcch-BlindDetection-r17 INTEGER ::= 16 -- Maximum number of combinations of PDCCH blind detection monitoring

 -- capabilities

maxNrofAltitudeRanges-r18 INTEGER ::= 8 -- Maximum number of altitude ranges for altitude-based measurement configurations

maxWayPoint-r18 INTEGER ::= 20 -- Maximum number of flight path information waypoints

maxAltitude-r18 INTEGER ::= 10000 -- Maximum altitude in meters

minAltitude-r18 INTEGER ::= -420 -- Minimum altitude in meters

maxMeasSequence-r18 INTEGER ::= 64 -- Maximum number of configured sequence for measurement

maxNrofHops-1-r18 INTEGER ::= 5 -- Maximum number of Hops that can be configured for Positioning SRS Transmission

maxNrOfCellsInVA-r18 INTEGER ::= 16 -- Maximum number of cells in validity area for Positioning SRS

maxNrOfCellsInVA-Ext-r18 INTEGER ::= 16 -- Maximum number of additional cells in validity area for Positioning SRS

maxNrOfLinkedSRS-PosResourceSet-r18 INTEGER ::= 3 -- Maximum number of linked SRSPosResourceSets that can be aggregated across

 -- CCs

maxNrOfLinkedSRS-PosResSetComb-r18 INTEGER ::= 32 -- Maximum number of combinations of linked SRSPosResourceSets that can be

 -- aggregated in RRC\_CONNECTED state

maxNrOfLinkedSRS-PosResSetCombInactive-r18 INTEGER ::= 16 -- Maximum number of combinations of linked SRSPosResourceSets that can be

 -- aggregated in RRC\_INACTIVE state

maxCBR-ConfigDedSL-PRS-1-r18 INTEGER ::= 7 -- Maximum number of CBR ranges for dedicated SL PRS resource pool

maxCBR-LevelDedSL-PRS-1-r18 INTEGER ::= 15 -- Maximum number of CBR levels for dedicated SL PRS resource pool

maxNrofSL-PRS-TxPool-r18 INTEGER ::= 8 -- Maximum number of Tx dedicated SL-PRS resource pool for NR sidelink positioning

maxNrofSL-PRS-TxConfig-r18 INTEGER ::= 64 -- Maximum number of SL PRS transmission parameter configurations

maxNrOfVA-r18 INTEGER ::= 16 -- Maximum number of validity area

maxNrofLTM-Configs-r18 INTEGER ::= 8 -- Maximum number of LTM candidate cells

maxNrofLTM-Configs-plus1-r18 INTEGER ::= 9 -- Maximum number of LTM candidate cells plus 1

maxNrofLTM-CSI-ReportConfigurations-r18 INTEGER ::= 48 -- Maximum number of LTM CSI reporting configurations

maxNrofLTM-CSI-ReportConfigurations-1-r18 INTEGER ::= 47 -- Maximum number of LTM CSI reporting configurations minus 1

maxNrofLTM-CSI-SSB-ResourcesPerSet-r18 INTEGER ::= 512 -- Maximum number of LTM CSI SSB resource per set

maxNrofLTM-CSI-ResourceConfigurations-r18 INTEGER ::= 112 -- Maximum number of LTM CSI resource configurations

maxNrofLTM-CSI-ResourceConfigurations-1-r18 INTEGER ::= 111 -- Maximum number of LTM CSI resource configurations minus 1

maxNrofCandidateTCI-State-r18 INTEGER ::= 128 -- Maximum number of LTM TCI states

maxNrofCandidateUL-TCI-r18 INTEGER ::= 64 -- Maximum number of LTM UL TCI states

maxSecurityCellSet-r18 INTEGER ::= 9 -- Maximum number of cell sets for subsequent CPAC.

maxSK-Counter-r18 INTEGER ::= 8 -- Maximum number of SK-counters configured for a cell set for subsequent CPAC.

maxNrofThresholdMBS-r18 INTEGER ::= 8 -- Max number of thresholds of MBS sessions for RRC connection resume for a

 -- UE receiving multicast in RRC\_INACTIVE

maxNrofThresholdMBS-1-r18 INTEGER ::= 7 -- Max number of thresholds of MBS sessions for RRC connection resume for a

 -- UE receiving multicast in RRC\_INACTIVE minus 1

maxTN-AreaInfo-r18 INTEGER ::= 32 -- Maximum number of TN coverage areas for which assistance info is

 -- provided in an NTN cell

maxNrofSetsOfCells-r18 INTEGER ::= 4 -- Maximum number of sets of cells for multi-cell PDSCH/PUSCH scheduling

maxNrofSetsOfCells-1-r18 INTEGER ::= 3 -- Maximum number of sets of cells for multi-cell PDSCH/PUSCH scheduling

 -- minus 1

maxNrofCellsInSet-r18 INTEGER ::= 4 -- Maximum number of cells configured in a set of cells for multi-cell

 -- PDSCH/PUSCH scheduling

maxNrofCellsInSet-1-r18 INTEGER ::= 3 -- Maximum number of cells configured in a set of cells for multi-cell

 -- PDSCH/PUSCH scheduling minus 1

maxNrofCellCombos-r18 INTEGER ::= 16 -- Maximum number of combinations of co-scheduled cells for multi-cell

 -- PDSCH/PUSCH scheduling

maxNrofBWPsInSetOfCells-r18 INTEGER ::= 16 -- Maximum number of BWPs configured in a set of cells for multi-cell

 -- PDSCH/PUSCH scheduling

maxLowerMSD-r18 INTEGER ::= 256 -- Maximum number of lower MSD capability sets for a victim band

maxLowerMSDInfo-r18 INTEGER ::= 64 -- Maximum number of lower MSD capability sets for a band combination

maxNrofIntraEndc-Components-r17 INTEGER ::= 4 -- Maximum number of intra-band (NG)EN-DC band components in an inter-band

 -- (NG)EN-DC band combination

-- TAG-MULTIPLICITY-AND-TYPE-CONSTRAINT-DEFINITIONS-STOP

-- ASN1STOP

==========================================================CHANGE ENDS=======================================================

# Annex: List of agreements during R19 XR discussion

#### RAN2#125bis

Multi-modality:

- For the purpose of study, RAN2 assumes that UE and gNB have some kind of multi-modal information;

- FFS what information is needed/useful, e.g. just multi-modal ID, association between the flow, synchronization requirement etc.

- RAN2 will study both UL and DL directions based on the assumption of multi-modality association knowledge at RAN/UE;

- RAN2 will focus on analysing potential usage and benefits (e.g. in terms of capacity and power saving) of multi-modal association knowledge;

- Areas to study include: synchronization between the flows, FFS impact on QoS insurance and other areas;

- RAN2 assumes that traffic of different modals having different QoS requirements is mapped to different QoS flows;

- For different XR traffic flows belonging to the same Multi-modal service and having different QoS requirements, it should be possible to provide differentiated QoS handling over the air. RAN2 should study if that is possible with current mechanism or new ones are needed;

- Existing QoS flow to DRB mapping framework is used as a baseline, i.e. up to gNB how to map QoS flows to DRBs.

Scheduling Enhancements:

- RAN2 will study whether/how to resolve the issue of data with low remaining time being delayed due to other data from LCHs with higher LCH priority when using the existing LCP procedure. At least the following alternatives will be studied:

- Alternative 1: Enhance LCP restrictions/LCH selection;

- Alternative 2: Enhance LCH prioritization;

- RAN2 should consider potential impact on traffic from SRBs.

- RAN2 will study enhancing existing DSR with additional information, e.g. multiple pairs of remaining time/buffer information, importance - FFS whether this only includes more information on delay-critical data or also information about non-delay critical data.

RLC Enhancements:

- We focus on RLC AM;

- RAN2 will analyse solutions to ensure timely RLC retransmission(s) for XR;

- RAN2 will analyse how to avoid unnecessary retransmissions (e.g. to avoid reTx of out-dated packets).

#### RAN2#126

Multi-modality:

- Support Multi-Modality awareness in RAN in Rel-19 for UL and DL.

Scheduling enhancements:

- For LCP enhancements, LCP Prioritisation:

- Delay-aware LCP enhancement to resolve the issue of data with low remaining time being delayed due to data from other LCHs with no delay critical data is supported in Rel-19 XR;

- The solution should consider impact on UE complexity (as already indicated in SI objective description);

- For delay-aware LCP enhancement, RAN2 considers the following option to override/adjust the priority of LCH based on delay/deadline information as a baseline:

- Use additional priority configured to LCHs in case of these LCHs with delay-critical data.

- FFS whether the priority only applies to delay-critical data within the LCH or for the whole LCH.

- For LCP enhancements, LCH Restrictions:

- We try to avoid RAN1 impacts;

- RAN2 assumes no dynamic indications are needed for triggering the delay-aware LCP mechanism. RAN2 assumes this mechanism is configured in a semi-static way;

- For LCP restrictions based solutions, RAN2 will not discuss solutions requiring RAN1 work. FFS whether other LCP restrictions based approaches are needed/beneficial;

- The solutions should not disallow non-delay critical data from using an UL grant.

- For LCP enhancements, Granularity:

- LCP prioritization within a logical channel will not be considered in RAN2 discussions;

- FFS whether a separate remaining time threshold can be configured for delay aware LCP (i.e. different from the one used for DSR).

- For DSR enhancements:

- Enhance DSR to report with multiple pairs of remaining time and buffer size for the LCG;

- FFS whether DSR triggering is impacted;

- FFS whether PDU set importance needs to be included.

Regarding RLC enhancements:

- For avoiding unnecessary retransmissions:

- For avoiding unnecessary RLC AM retransmissions, RAN2 to enhance the RLC AM by adopting enhancements from one of the following perspectives:

1. Rx initiated approach

2. Tx initiated approach

- RAN2 will discuss details of both approaches, compare them and choose one once the details are clearer.

- For Tx initiated approach:

- The transmitting side of AM RLC entity notifies the receiving RLC side about the obsolete SDUs;

- Tx side stops retransmit obsolete SDUs;

- Rx side updates state variables according to the information from Tx side.

- For Rx initiated approach:

- For proper advancing of the transmitting window, RLC AM is enhanced with a way for the receiver to indicate abandoned SDUs to the transmitter;

- Tx side just processes the status report as in legacy;

- FFS how Rx side determines that an SDU should be abandoned.

- For autonomous retransmissions:

- To achieve timely retransmissions on RLC layer for XR traffic, RAN2 will consider the following options:

- Autonomous retransmission (i.e. without status report) of PDUs based on some triggers (existing or new triggers can be considered);

- Retransmission based on enhanced status report;

- Retransmission based on enhanced polling;

- FFS whether any enhancements are needed or this can be solved with proper configuration and current mechanism.

- Impact on capacity should be considered;

- RAN2 focuses on the enhancements for UL traffic.

#### RAN2#127

Multi-modality:

- Working assumption: Regardless of SA2 decision, RAN2 can extend the UAI for multi-modal awareness at least for uplink QoS flows in Rel-19 XR, by having the UE report existence of multi-modality application and association information among QFIs to gNB.

- FFS whether this can be applied to DL

- RAN2 considers that based on multi-modal information:

- The gNB may perform joint admission control. Details can be left up to RAN3 in potential WI phase. FFS if MMSID can be used for this purpose.

- The gNB may consider this information during QoS flow to DRB mapping (up to gNB implementation)

- For UL, RAN2 does not intend to perform LCP enhancements due to complexity vs gains concerns.

- For DL, whether traffic synchronization (on a per packet basis) can be achieved depends on whether packet level synchronization information can be provided from CN to RAN.

- For PDU set discard enhancements:

- RAN2 thinks PDU Set discard across QoS flows of the same multi-modal service based on the dependency information between the multi-modal flows can only be achieved in case the synchronization information can be available at the UE which is up to SA2/SA4.

- RAN2 thinks in case this is feasible, it should be limited to intra-DRB case.

- For DRX enhancements:

- Not support multiple active DRX configurations

Scheduling enhancements (also study phase), RAN2 agreed:

- RAN2 to no longer consider the enhancement of the LCP restriction, as one of the candidate solutions for LCP enhancements in Rel-19 XR

- Network should be able to configure multiple remaining time thresholds for reporting for each LCG to report multiple pairs of remaining time and buffer sizes per LCG.

- For enhanced DSR:

- There will be a single triggering threshold, as in Rel-18. FFS whether there are any constraints on how the NW configures DSR triggering and reporting thresholds

- FFS whether there is any impact on delay critical data definition due to multiple reporting thresholds in the DSR

- FFS whether to include non-delay critical data ahead of delay critical data in the buffer size calculation for DSR

- FFS whether/how additional priority impacts intra-UE prioritization (can be discussed in stage-3)

Regarding RLC enhancements:

- For Unnecessary retransmissions:

- Any solution should ensure that windows at Tx side and Rx side are not out of sync. As a baseline, we assume Rx window advances before Tx window advances FFS if for Tx approach window sync needs to be achieved in another way, e.g. advancing Tx window first.

- In the RX-initiated approach for avoiding unnecessary retransmissions, RLC receiver abandons missing SDUs like already done by PDCP, i.e. based on a timer.

- In addition to Tx and Rx approaches, RAN2 will consider a combined Rx and Tx approach, where

- Tx side stops to retransmit an obsolete SDUs based on the discard indication/a number of retransmissions as for Tx initiated approach

- Rx side stops to receive an obsolete SDU based on local timer as for Rx initiated approach

#### RAN2#127bis

Agreements for RRM measurement gap skipping:

1. RAN2 assumes that at least some impact on DSR from MG skipping can be avoided by NW implementation. FFS whether there is an impact which would require some specification changes/enhancements.

2. No need to have delay-aware LCP enhancements specific for MG skipping, i.e. MG skipping and delay-aware LCP are designed as independent features

3. RAN2 can further evaluate whether there is any impact on DRX from MG skipping. For the moment, the issue is unclear.

4. RAN2 will focus its work on supporting the solution chosen by RAN1/RAN4.

5. RAN2 can discuss whether there is a need to additionally have other solution (e.g. RRC-based) which can be decided after RAN1/RAN4 evaluation and knowing more details of DCI-based solution.

Agreements on LCP enhancements:

1. As a baseline, additional LCH priority is applied for an LCH in both 1st and 2nd Rounds of resource allocation procedure in LCP, as long as the LCH has delay-critical data available for transmission when starting the 1st Round.

2. FFS if we can still change the priority for the 2nd round to ensure fairness, but we need to consider tight timeline of LCP procedure and UE complexity. Companies can also check whether we can leave this to UE implementation.

3. Introduce an independent per-LCH remaining time threshold for applying delay-critical priority.

4. We do not introduce any setting restrictions of this new remaining time threshold with relation to DSR triggering threshold.

Agreements on DSR enhancements:

1. We do not change the definition of delay-critical data

2. For the sake of RAN2 discussions, we use the following terms: triggering threshold, reporting threshold(s)

3. Companies should analyse the impact of setting the triggering threshold to value lower than largest reporting threshold on DSR procedure, e.g. triggering, cancellation etc.

4. For Rel-19 DSR, the buffered data is divided into multiple portions based on the multiple reporting time threshold levels configured for an LCG. The Rel-19 DSR indicates the following information for each portion for which BS>0:

• Buffer size of data volume in each portion

• Shortest remaining time among PDCP SDUs buffered in each portion.

5. There is no need to include PSI in the enhanced DSR MAC CE.

6. A one-bit indication may indicate whether a certain/further pair of remaining time information and buffer size information is present in the new DSR MAC CE for the associated LCG.

7. FFS whether old and new DSR can be configured/used at the same time or we always use a new DSR in case there is at least one LCG configured with multiple reporting thresholds

Agreements on RLC timely retransmissions:

1. RAN2 confirm that existing mechanisms are insufficient to resolve the timely RLC retransmission problem and RLC enhancements for timely RLC retransmission are investigated in Rel-19.

2. Exclude enhanced status reporting.

3. Focus the discussion on autonomous retransmission and polling enhancements, e.g. we need to understand how each option affects the capacity and packet delay

Agreements on avoiding unnecessary retransmissions:

1. RAN2 confirm the previous baseline assumption: the RLC receiving window always advances to any given RLC SN before the transmitting window does.

2. RAN2 will adopt a “combined” approach for avoiding unnecessary RLC retransmissions, i.e.

• TX side stops transmissions of an outdated SDU

• RX side abandons the SDU based on a local timer

• Rx informs Tx side about the abandoned SDUs, as a baseline we assume existing SR can be reused unless issues are identified

• FFS if some C-PDU handling is needed to avoid C-PDU discard

• FFS if some indication is sent from Tx to Rx. The assumption is this is not a full status report, but something simple (if needed)

Agreements on XR rate control

1. FFS if the indication is per DRB or per QoS flow. Companies should analyse the impact on QoS enforcement, interworking with L4S etc.

2. RAN2 to consider the following approaches to provide recommended bit rate values better fitting XR applications:

- Extend the Bit Rate field

- Define a new bit rate table to provide sufficient granularity for XR traffic

- Introduce new values for the bitRateMultiplier

3. Send LS to SA4 asking about range/granularity which is required

#### RAN2#128

Agreement for the reply to SA2 on PDU set information: RAN2 confirms that it can be useful for gNB to have PDU Set Information marking without PDU Set QoS parameters.

Agreements on RRM measurement gaps impacts:

1. No MG-specific enhancements is needed on DSR operation.

2. RAN2 assumes that UE follows DRX pattern as currently, even when MG is indicated as skipped

3. No MG-specific enhancements is needed for DRX operation.

Agreements on LCP prioritization:

1. As a baseline, the additional LCH priority is applied to both the first round and the second round of the LCP procedure. The UE does not fallback to the default LCH priority in the second round even if there is no more LCH priority-adjusted data after the first round.

2. As an optional capability, the UE can also support to fallback to default priority in the 2nd round of LCP.

Agreements on DSR enhancements:

- Let the network configure the triggering and reporting thresholds without constraints.

- RAN2 understanding is that the data that has been already reported in the DSR should not trigger another DSR

- The existing cancelling and triggering of Rel-18 DSR is reused for the enhanced DSR.

- The UE may also support including non-delay critical data ahead of delay critical data in the buffer size calculation for DSR, which is a capability indicated to the NW.

Agreements on AL-FEC (related to LS from SA2):

- There is no consensus in RAN2 that AL-FEC ratio information is useful for the gNB for both RLC AM and RLC UM.

- RAN2 understanding is that in case this information would be provided to the gNB, it is up to gNB how/whether to consider it, i.e. no impact on RAN2 specifications

Agreements on unnecessary RLC retransmissions:

- There is no clear understanding on how the indication would look like or what problem it would solve that cannot be solved by the local timer

- Unless critical issue is identified, no Tx to Rx indication will be introduced

- Special handling to avoid PDCP control PDU discard is not needed.

- A new RLC timer at the Rx is introduced to determine obsolete RLC SDUs. The timer starts when the gap is detected at RLC layer.

- The abandoned RLC SDUs determined by a new RLC timer are positively acknowledged in the STATUS report.

Agreements on timely RLC retransmissions:

- Timely RLC retransmission solution covers both autonomous retransmission and polling enhancement and NW can configure either or both of them.

Agreements on XR rate control

1. RAN2 confirms it is feasible for RAN to estimate the congestion information at both per-DRB and per-QoS flow level.

2. gNB can be indicated which QoS flows can be throttled. FFS whether this is indicated from UE/CN

3. Rate indication from gNB to the UE on a per QoS flow level is supported. FFS the details, e.g. if: 1) flows are indicated by MAC CE or 2) by RRC while MAC CE is per DRB.

4. RAN2 will not discuss/support rate indication for DL unless WID is updated to include it by RANP.

5. RAN2 assumes that the congestion situation can be known at the gNB without any indication from the UE

6. FFS whether UL MAC CE rate query/preference is supported as UE recommendation to the NW or whether legacy MAC CE can serve this already. FFS in which scenarios this is useful.

#### RAN2#129

Agreements on MG skipping

* From MAC perspective, the UE behaves as if there is no activated measurement gap during a skipped/cancelled measurement gap occasion.
* “Cancelled” or “skipped” terminology will be aligned with RAN1 specifications when implementing changes in MAC.
* RAN2 will not work on semi-static MG skipping solutions unless requested by RAN4/RAN1

Agreements on LCP enhancements

* Only one additional priority is configured to an LCH for LCP enhancement.
* We keep an existing agreement (remaining time th reshold is configured per LCH)
* There is no impact on BSR/SR/DSR triggering and reporting due to adjusted priority.
* Intra-UE prioritization shall also use the additional LCP priority for UL grant priority determination. FFS whether this has specifications impact
* FFS Intra-UE prioritization shall also use the additional LCP priority for SR priority determination
* No additional PBR is needed for priority adjusted data
* FFS Allow an LCH with an upgraded priority to be transmitted even if Bj is negative (if configured by the network), while the remaining time is less the configured threshold.

Agreements on DSR enhancements

* One extension bit (e.g. by redefining the reserved R bit) can be used to indicate whether a further pair of remaining time and buffer size information is present for the associated LCG in the enhanced DSR MAC CE.
* FFS New DSR MAC CE will (always) be used when at least one LCG is configured with multiple thresholds.
* We do not support truncated DSR nor fallback to legacy DSR in case of limited PUSCH grant size.
* Different LCGs may be configured with different number of reporting thresholds.
* If UE is configured to use R19 DSR, then any LCG with a triggering threshold shall be configured with at least one reporting threshold.
* Triggering threshold is not used as a reporting threshold (but one of reporting thresholds can be configured to the same value as triggering threshold).
* Do not support a configuration of an LCG without any triggering threshold but with DSR reporting threshold(s).

Autonomous retransmissions and polling enhancements

* Autonomous retransmission and/or polling should be triggered when the remaining time of an RLC SDU falls below a specified threshold. FFS if remaining time is determined based on discardTimer at PDCP or new timer at RLC
* Only a single autonomous retransmission will be triggered per RLC SDU.
* There is no dynamic activation/deactivation of the autonomous retransmission mechanism.
* We have separate thresholds for autonomous reTx and for polling

Unnecessary retransmissions avoidance

* When the TX RLC entity receives a discard indication of the SDU from PDCP, the TX RLC entity considers the SDU as an outdated SDU. The TX RLC entity does not perform any transmission and retransmission of such SDU/SDU segment.
* A new RLC timer at the TX is not introduced to determine outdated RLC SDUs.
* The new RLC timer at the RX is per RLC entity
* The duration of the new RLC timer is not lower than that of t-reassembly
* Proposals 4 and 6 from R2-2500380 and P3 and 4 from R2-2500401 will be discussed together with RLC CR review

Agreements on XR rate control

* RAN2 assumes for XR rate control, the gNB receives QoS flow information from the CN, specifying which QoS flows are subject to uplink rate control (i.e., Option 2). Send an LS to RAN3 and SA2.
* We may revisit UAI option based on SA2/RAN3 reply
* Specify a new table for XR rate control. FFS distribution (exponential, linear), codepoints etc.
* We will try to design a table first and check whether it is possible to meet the required range/granularity. Afterwards, we can check whether multipliers are needed
* Working assumption:
* Support rate query MAC CE with the target to use same design that we will agree for rate indication MAC CE.
* The rate query MAC CE is configurable by the network, i.e. the network may turn it off completely (same as legacy).
* Companies to check with their SA4 colleagues whether there are any issues with this