**3GPP TSG-RAN2 #121bis-e R2-230xxxx**

**Electronic meeting, April 17 – April 26, 2023**

**Agenda item:**x.x.x

**Source:** Samsung (Rapporteur)

**Title:** Summary of [AT121bis-e][003][NR1516] RRC 2 (Samsung)

**Document for:** Discussion and Decision

# 1. Introduction

This document is a summary of the following discussion.

* [AT121bis-e][003][NR1516] RRC 2 (Samsung)

Scope: Treat R2-2302595, R2-2302596, R2-2302597, R2-2302666, R2-2302667, R2-2303106, R2-2303107, R2-2304096, R2-2304091, R2-2304092, R2-2302771, R2-2304138, R2-2304140, R2-2303871, R2-2303872  
Ph1: Determine agreeable parts. Ph2: For agreeable parts, if any, reflect these in agreeable CRs.

Intended outcome: Report, If applicable: In-Principle-Agreed CRs

Deadline: Ph1: Thursday April 21th 1200 UTC; Ph2: Wednesday April 26th 1000 UTC (EOM)

# 2 Contact Information

|  |  |
| --- | --- |
| Company | Contact: Name (E-mail) |
| Samsung | Anil Agiwal (anilag@samsung.com) |
| Xiaomi | Wangshukun3@xiaomi.com |
| MediaTek | chun-fan.tsai@mediatek.com |
| ZTE | liu.jing30@zte.com.cn |
| Apple | Ralf Rossbach (rrossbach@apple.com) |
|  |  |

# 3. Discussion

## 3.1 [R15] Recommended bit rate query

|  |
| --- |
| R2-2302595 38.331\_R15\_CR (Cat F)\_Corrections to recommended bit rate query Samsung  CR Rel-15 38.331 15.21.0 3950 - F NR\_newRAT-Core  R2-2302596 38.331\_R16\_CR (Cat A)\_Corrections to recommended bit rate query Samsung CR Rel-16 38.331 16.12.0 3951 - A NR\_newRAT-Core  R2-2302597 38.331\_R17\_CR (Cat A)\_Corrections to recommended bit rate query Samsung  CR Rel-17 38.331 17.4.0 3952 - A NR\_newRAT-Core |

**Reason for change**

|  |
| --- |
| UE can trigger Recommended bit rate query a logical channel and for a direction (i.e. for uplink or downlink). According to TS 38.321 (highlighted text below), Recommended bit rate query for a logical channel and direction can be transmitted only if *bitRateQueryProhibitTimer* is configured for the logical channel and the direction. “5.18.10 Recommended Bit Rate :  The MAC entity may request the gNB to indicate the recommended bit rate for a specific logical channel and a specific direction. If the MAC entity is requested by upper layers to query the gNB for the recommended bit rate for a logical channel and for a direction (i.e. for uplink or downlink), the MAC entity shall:  1> if a Recommended bit rate query for this logical channel and this direction has not been triggered:  2> trigger a Recommended bit rate query for this logical channel, direction, and desired bit rate.  If the MAC entity has UL resources allocated for new transmission the MAC entity shall:  1> for each Recommended bit rate query that the Recommended Bit Rate procedure determines has been triggered and not cancelled:  2> if *bitRateQueryProhibitTimer* for the logical channel and the direction of this Recommended bit rate query is configured, and it is not running; and  2> if the MAC entity has UL resources allocated for new transmission and the allocated UL resources can accommodate a Recommended bit rate MAC CE plus its subheader as a result of LCP as defined in clause 5.4.3.1:  3> instruct the Multiplexing and Assembly procedure to generate the Recommended bit rate MAC CE for the logical channel and the direction of this Recommended bit rate query;  “  **Issue:** According to TS 38.331, there is no separate configuration of *bitRateQueryProhibitTimer* for DL and UL. *bitRateQueryProhibitTimer* is optionally configured only for UL (LogicalChannelConfig -> ul-SpecificParameters). As a result, based on current MAC procedure, recommended bit rate query for a logical channel and DL direction can be triggered (as per grey highlighted text) but MAC entity can not transmit Recommended bit rate query MAC CE for the DL (as per green highlighted text). |

**Question 1: Do companies agree with the intention of the CR? If so, do companies support the changes in the CR?**

|  |  |  |  |
| --- | --- | --- | --- |
| Company | Agree with intention? (Y/N) | Support the change? (Y/N) | Comments |
| Lenovo | No | **No** | The recommended bit rate functionality has been adopted from LTE.  There is no need to configure bitRateQueryProhibitTimer for UL and DL separately. The UE can use the configured bitRateQueryProhibitTimer independently for each direction. The blue highlighted part in MAC spec refers to direction as configured per RLC-Config (RLC-AM is bidirectional, but RLC-UM can be bidirectional or unidirectional).  2> if *bitRateQueryProhibitTimer* for the logical channel and the direction of this Recommended bit rate query is configured, … |
| Samsung | Y (Proponent) | Y (Proponent) | The issue arises because *bitRateQueryProhibitTimer* is configured inul-SpecificParameters. Note that bit rate query procedure is same in LTE and NR. However, in LTE *bitRateQueryProhibitTimer* is configured outside ul-SpecificParameters in LogicalChannelConfig. So it can be configured for logical channel with DL only, UL only, both DL and UL.  In NR, *bitRateQueryProhibitTimer* is optionally configured only for UL.   * So for logical channel with UL and DL, LogicalChannelConfig -> ul-SpecificParameters🡪 *bitRateQueryProhibitTimer* can be applied for both DL and UL.   For logical channel with DL only, LogicalChannelConfig -> ul-SpecificParameters🡪 *bitRateQueryProhibitTimer* cannot be configured. So *bitRateQueryProhibitTimer* configuration outside ul-SpecificParameters is needed. |
| Xiaomi | No | No | Bit rate recommendation query is only from UE to GNB and the timer is also only for bit rate recommendation query. So no DL/UL direction differentiation.  It can indicate that the timer is for both DL and UL direction query in 331 field description or remove “and the direction” from MAC spec.  Anyway, no new parameters. |
| Huawei, HiSilicon | Partially | **No** | We think that the existing fields controls both UL and DL directions, so we don’t agree to add a new field from Rel-15 for DL only. But we are open to discuss the change to the explanation for the condition UL. |
| MeidaTek | No | No | Adding new RRC controlling parametering with capability is clear an NBC change in R15, which we are not able to aceept it.  Not sure about the use case for “Recommended Bit Rate”. We understand it is for voip and the logic channel should be bi-directional. We don’t think it is essential to handle DL-only RLC channel.  If some alignment is needed, we prefer to change the grey highlighted in MAC SPEC, to clarify the UE only initial the enquiry when *bitRateQueryProhibitTimer* is configured. |
| ZTE | No | No | Similar view as MTK, the use case is for voice service and it is not DL-only.  We understand the motivation of the CR, but it is too late and indeed NBC for Rel-15 network/UEs, so we suggest to consider signalling change only if the use case is identified in real deployment. |
| Apple | Y | Y | The RRC spec embeds the timer in the UL specific IEs of LogicalChannelConfig, which does not appear correct for DL only configs. We are OK to clarify/correct this in the spec. |
|  |  |  |  |

**Rapporteur summary on Q1**

…

## 3.2 [R16 NR-U] CG parameters in NR-U

|  |
| --- |
| R2-2302666 Clarifications on CG Parameters in NR-U vivo CR Rel-16 38.331 16.12.0 3958 - F NR\_unlic-Core  R2-2302667 Clarifications on CG Parameters in NR-U vivo CR Rel-17 38.331 17.4.0 3959 - A NR\_unlic-Core |

**Reason for change**

|  |
| --- |
| 1. For the field *cg-StartingFullBW-InsideCOT* in *CG-StartingOffsets*, it is used to configure a set of configured grant PUSCH transmission starting offset indices, instead of a set of absolute offset variables for cyclic prefix extension. Thus, a correction is needed. 2. For either c*g-StartingPartialBW-InsideCOT* or *cg-StartingPartialBW-OutsideCOT*, only one configured grant PUSCH transmission starting offset index can be configured via them, rather than a set of offset indices. To make it clear, corrections are needed. |

**Question 2: Do companies agree with the intention of the CR? If so, do companies support the changes in the CR?**

|  |  |  |  |
| --- | --- | --- | --- |
| Company | Agree with intention? (Y/N) | Support the change? (Y/N) | Comments |
| Samsung | Y | **Y** | Editorial correction on field description which is not aligend with ASN.1 |
| Xiaomi | Yes | Yes |  |
| Huawei, HiSilicon | Y | **Y** | No strong view but not quite essential.  Although it indicates indice, but indice also leads to offsets, which is essentially not wrong |
| MediaTek | Yes | **Yes** | No strong view. Seems not eseential though. |
| Apple | Y | Y | Minor correction to align 1) the field description of both cg-StartingFullBW-InsideCOT and cg-StartingFullBW-OutsideCOT, and 2) to correct the index which is not a set of CGs. |
|  |  |  |  |

**Rapporteur summary on Q2**

…

## [R16 NR-U] RSSI measurement frequency

|  |
| --- |
| R2-2303106 Clarification on RSSI measurement frequency Samsung R&D Institute India CR Rel-16 38.331 16.12.0 3983 - F NR\_unlic-Core  R2-2303107 Clarification on RSSI measurement frequency Samsung R&D Institute India CR Rel-17 38.331 17.4.0 3984 - A NR\_unlic-Core |

**Reason for change**

|  |
| --- |
| Present spec in sec 5.5.3.1 is ambiguous about which frequency indicated in the associated measObject (MO) to be used to perform RSSI and channel occupancy measurement. NR procedure is largely inherited from LTE. LTE MO has only *carrier-Frequency* and same is used for RSSI measurement. However NR MO may have *ssbFrequency*, *refFreqCSI-RS* and *rmtc-Frequency* configured and it is not clearly and explicitly stated that *rmtc-Frequency* be used for RSSI measurement for NR-U. Hence, there is a need to make it unambiguous for implementators. |

**Question 3: Do companies agree with the intention of the CR? If so, do companies support the changes in the CR?**

|  |  |  |  |
| --- | --- | --- | --- |
| Company | Agree with intention? (Y/N) | Support the change? (Y/N) | Comments |
| Samsung | Y (Proponent) | Y (Proponent) |  |
| Xiaomi | Yes | Yes |  |
| Huawei, HiSilicon | N |  | In clause 5.5.4.1, below condition/action guarantees there is no ambiguity regarding th applicable RSSI measurement center frequency. Consider this is Rel-16, the clarification CR is not critical to have if there is no ambiguity of UE behaviour.  "4> if the corresponding *reportConfig* includes *measRSSI-ReportConfig*:  5> consider the resource indicated by the *rmtc-Config* on the associated frequency to be applicable;" |
| MediaTek | Yes | Yes |  |
| Apple | Y | Y | The change could be shortened (or even extended) to “the frequency configured by *rmtc-Frequency*” as there is only one place where it can be configured, but no strong view. |
|  |  |  |  |

**Rapporteur summary on Q3**

…

## [R15] Security

|  |
| --- |
| R2-2304096 Clarification on the update of security algorithms Ericsson discussion Rel-15 NR\_newRAT-Core |

**Discussion**

|  |  |  |
| --- | --- | --- |
| According to the current specification, in current TS 38.331 clause 5.3.1.2 the following it is stated:  The integrity protection algorithm is common for SRB1, SRB2, SRB3 (if configured), SRB4 (if configured) and DRBs configured with integrity protection, with the same *keyToUse* value. The ciphering algorithm is common for SRB1, SRB2, SRB3 (if configured), SRB4 (if configured) and DRBs configured with the same *keyToUse* value. Neither integrity protection nor ciphering applies for SRB0.  :  RRC integrity protection and ciphering are always activated together, i.e. in one message/procedure. RRC integrity protection and ciphering for SRBs are never de-activated. However, it is possible to switch to a '*NULL*' ciphering algorithm (*nea0*).  :  The integrity protection and ciphering algorithms can only be changed with reconfiguration with sync. The AS keys (KgNB, KRRCint, KRRCenc, KUPint and KUPenc) change upon reconfiguration with sync (if *masterKeyUpdate* is included), and upon connection re-establishment and connection resume.  :  For a UE provided with an *sk-counter*, *keyToUse* indicates whether the UE uses the master key (KgNB) or the secondary key (S-KeNB or S-KgNB) for a particular DRB. The secondary key is derived from the master key and *sk-Counter*, as defined in TS 33.501[11]. Whenever there is a need to refresh the secondary key, e.g. upon change of MN with KgNB change or to avoid COUNT reuse, the security key update is used (see 5.3.5.7). When the UE is in NR-DC, the network may provide a UE configured with an SCG with an *sk-Counter* even when no DRB is setup using the secondary key (S-KgNB) in order to allow the configuration of SRB3. The network can also provide the UE with an *sk-Counter*, even if no SCG is configured, when using SN terminated MCG bearers.  According to the yellow statement, it is clear that the integrity protection and ciphering algorithm are the same for SRBs and DRBs that are terminated at the same anchor point.  Further, the green statement clarify that the integrity protection and ciphering algorithms can only be changed with reconfiguration with sync.   1. According to TS 38.331 clause 5.3.1.2, the reconfiguration with sync procedure is the only method to change the security algorithms at the UE.   However, according to the field condition of the field *securityAlgorithmConfig* within *RadioBearerConfig* IE, the understanding is that the security algorithms can also be provided to the UE even if reconfiguration with sync is not used.   |  |  | | --- | --- | | *RBTermChange1* | The field is mandatory present in case of:  - set up of signalling and data radio bearer,  - change of termination point for the radio bearer between MN and SN,  - handover from E-UTRA/EPC or E-UTRA/5GC to NR,  - handover from NR or E-UTRA/EPC to E-UTRA/5GC if the UE supports NGEN-DC.  It is optionally present otherwise, Need S. |  1. According to field condition of *securityAlgorithmConfig* within *RadioBearerConfig* IE, the security algorithms can also be provided to the UE even if reconfiguration with sync is not used.   This seems to be in contradiction with what is stated in TS 38.331 clause 5.3.1.2. According to this, it would be good for RAN2 to clarify what is the expected behaviour on how to change the security algorithms at the UE for both MN-terminated and SN-terminated bearers. In principle, three options can be considered, which are not mutually exclusive:   1. The security algorithms at the UE can only be changed with reconfiguration with sync (for both SRBs and DRBs). 2. The security algorithms at the UE can be changed by release and add of a radio bearer (at least for DRBs). 3. The security algorithms at the UE can be changed by just including *securityAlgorithmConfig* within *RadioBearerConfig* without the need of reconfiguration with sync or release and add of a radio bearer (at least for DRBs). |

**Question 4: Do companies agree with the issue raised in R2-2304096? If so, which of these options (which are not mutually exclusive) are feasible in order to change the security algorithms at the UE ?**

* 1. The security algorithms at the UE can only be changed with reconfiguration with sync (for both SRBs and DRBs).
  2. The security algorithms at the UE can be changed by release and add of a radio bearer (at least for DRBs).
  3. The security algorithms at the UE can be changed by just including *securityAlgorithmConfig* within *RadioBearerConfig* without the need of reconfiguration with sync or release and add of a radio bearer (at least for DRBs).

|  |  |  |  |
| --- | --- | --- | --- |
| Company | Agree with issue? (Y/N) | Feasible options (a/b/c) | Comments |
| Samsung | Y |  | The current procedural text seems insufficient. We may follow the field condition, RBTermChange1 |
| Xiaomi | Y | a | If the network wants to change the security algorithm after AS activation, option a) is needed. Because the algorithm is changed means the key is changed. So recocnfigu with sync is necessary. |
| Huawei, HiSilicon | No | **a** | The sentence in procedure text is 100% clear, and all UEs accept this for sure, so we don't see the need to do any change.  The presence condition mentions that securityAlgorithmConfig is mandatory in a number of cases but, as the procedure text says that it is the same algorithm for all RBs using the same key, if there is no reconfiguration with sync, the algorithm will be the same as the one already in use.  Perhaps it is not useful to repeat the algorithm in cases other than the ones where it is mandatory to include it, but that should not be an issue either. |
| MediaTek | No | **a** | We don’t think there is issue in current SPEC. The procedure text is clear it does not really conflict the the ”optional present” in conditional code. The NW could anyway include same security algorithm if it wants.  We don’t think it is feasible to change security algorithm without reconfiguration with sync. Only a is allowed in current SPEC. |
| ZTE | No | **a** | We think the sentence in normal text procedure is clear that reconfigurationWithSync is needed when network changes the security algorithms, for the ’optional, Need S’ statement in condition, the intention is to say the network is not forced to update secuity algorithm upon every reconfigurationWithSync. If the network does not include the field in case of reconfigurationWithSync, then it means the UE continues to use the currently configured algorithms.  So our understanding is option a) and no need to change the specification. |
| Apple | Y | a/b | Agree with others that option a) is the main option. |
|  |  |  |  |

**Rapporteur summary on Q4**

…

## nas-SecurityParamFromNR

|  |
| --- |
| R2-2304091 Clarification on nas-SecurityParamFromNR field description Ericsson CR Rel-16 38.331 16.12.0 4052 - A NR\_newRAT-Core  R2-2304092 Clarification on nas-SecurityParamFromNR field description Ericsson CR Rel-17 38.331 17.4.0 4053 - A NR\_newRAT-Core |

**Reason for change**

|  |
| --- |
| In the last RAN2 meeting, it was discussed on whether the field description of nas-SecurityParamFromNR should be updated to mention that this field includes the *NASSecurityParametersFromNGRAN*, as defined in TS 38.413. However, the discussion was posponed.  This CR is to align the field description in NR with what we have in LTE. |

**Question 5: Do companies agree with the intention of the CR? If so, do companies support the changes in the CR?**

|  |  |  |  |
| --- | --- | --- | --- |
| Company | Agree with intention? (Y/N) | Support the change? (Y/N) | Comments |
| Samsung | Y | **Y** |  |
| Xiaomi | Y | Y | “and and…”two and in the changes. |
| Huawei, HiSilicon | Yes | **Yes but** | this is not essential for Rel-15.  If there is a misc. correction CR for Rel-15, it is ok to include the change, otherwise Rel-17 only (and merged to misc. corrections if there is). |
| MediaTek | Yes | **Yes** |  |
| ZTE | Yes | **Yes with comments** | By adding the references, people needs to check CT1 specs in order to know what information should be included. We still prefer to capture more details in RRC spec, but if most companies are fine with this simple version, we are also fine.  We hope companies have the same understanding on the coding:   * 8 LSB of the downlink NAS COUNT value for NR to EUTRAN handover; * 4 LSB of the downlink NAS COUNT value for NR to UTRAN FDD handover(SRVCC). |
| Apple | Y | N | In principle we are fine to extend the field description. The proposed wording might seem a bit generic though - it will make it hard to trace the exact parameter in the NAS spec. So we would rather prefer to add something like “where the content of the parameter is defined in the value part of the *N1 mode to S1 mode NAS transparent container* IE, as specified in TS 24.501 [23]”. |
|  |  |  |  |

**Rapporteur summary on Q5**

…

## [R16] CSI-RS resource coordination in NR-DC

|  |
| --- |
| R2-2302771 CSI-RS resource coordination in NR-DC Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-Core  R2-2304138 CSI-RS resource coordination in NR-DC Nokia, Nokia Shanghai Bell CR  Rel-16 38.331 16.12.0 3990 2 F NR\_newRAT-Core, TEI16 R2-2304133  R2-2304140 CSI-RS resource coordination in NR-DC Nokia, Nokia Shanghai Bell CR  Rel-17 38.331 17.4.0 3991 2 A NR\_newRAT-Core, TEI16 R2-2304135 |

**Reason for change**

|  |
| --- |
| RRC inter-node messages are used for MN-SN coordination of resources for MR-DC, with certain aspects (e.g. measIDs, frequencies) that are per-UE or per-carrier being part of the signalling. CSI-RS/SRS resource coordination is not currently possible, but is still required according to UE capabilities, making it impossible for network in some cases to utlize the UE capabilities. |

**Question 6: Do companies agree with the intention of the CR? If so, do companies support the changes in the CR?**

|  |  |  |  |
| --- | --- | --- | --- |
| Company | Agree with intention? (Y/N) | Support the change? (Y/N) | Comments |
| Xiaomi | Not suee | **Not sure** | I wonder whether it need RAN1 confirmation? |
| Huawei, HiSilicon | Not sure | **No** | The use cases are not clear. Should it not be only for "AllCC" capabilities? Why are fields not matching any "AllCC" capability? Why are some CSI-RS "AllCC" capabilities ignored? |
| MediaTek | Yes | **No strong view** |  |
| ZTE | Maybe | No | We raised similar issue in Rel-16 (CLI), see R2-1916128, but we proposed not to coordinate the CSI-RS capabilities, because most capabilities are defined to indicate the maximum number for “**simultaneous**” CSI-RS resources, in our view, it means the limitation for CSI-RS on the same slot/symbol. From network perspective, it is very difficult to do slot or symbol level coordination between MN and SN.  In the CR, there are some capabilities that are not defined as allCC, we think there should be no problem for those capabilities.  In addition, the capabilities listed are related to L1 CSI-RS measurement, not L3 CSI-RS measurement, for L3, the capability is maxNumberCSI-RS-RRM-RS-SINR, but as we discussed in R2-1916128, it is very hard to do slot level coordination between MN and SN. |
| Apple | Y | No strong view | Support to enable coordination of the CSI-RS resource via inter-node messages. The change affects NW implementation and there is a node compatibility aspect, so we are neutral at this stage. |
|  |  |  |  |

**Rapporteur summary on Q6**

…

## [R16] reconfiguration including T316

|  |
| --- |
| R2-2303871 Correction on reconfiguration including T316 Lenovo CR Rel-16 38.331 16.12.0 4029 - F LTE\_NR\_DC\_CA\_enh-Core  R2-2303872 Correction on reconfiguration including T316 Lenovo CR Rel-17 38.331 17.4.0 4030 - F LTE\_NR\_DC\_CA\_enh-Core |

**Reason for change**

|  |
| --- |
| To support the Rel-16 feature of fast MCG link recovery, T316 is configured in RRCReconfiguration message using ‘setuprelease’. If the RRCReconfiguration message includes the t316 and sets to setup, UE will consider itself to be configured to support fast MCG link recovery. Otherwise, UE should release the configuration of t316 if UE is maintaining the configuration of T316. The text procedure related to the reception of t316 should be described in ‘5.3.5.3 Reception of an RRCReconfiguration by the UE’. However, it is missing in Rel-16 and Rel-17 RRC specification. |

**Question 7: Do companies agree with the intention of the CR? If so, do companies support the changes in the CR?**

|  |  |  |  |
| --- | --- | --- | --- |
| Company | Agree with intention? (Y/N) | Support the change? (Y/N) | Comments |
| Samsung | - | **-** | Seems not essential. Ok to follow majority view. |
| Xiaomi | Yes | Yes |  |
| Huawei, HiSilicon | No | **No** | The text in 5.1.2 is perfectly applicable to t316 and does as expected, we see no reason to change. |
| MediaTek | No | **No** | One of triggering condition of fast SCG recovery is “if T316 is configured”. So it is already clear. This additional change is not needed. |
| ZTE | Maybe | **Yes, but** | We think the CR is not essential, can be merged with Rapporteur CR. |
| Apple | - | - | The behavior seems clear enough from other parts of the specification, but good to make the text more consistent. We are fine to follow majority view. |
|  |  |  |  |

**Rapporteur summary on Q7**

…

# 3. Conclusions

**To be filled later**