**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 R[2-2302595](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302595.zip), R[2-2302596](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302596.zip), R[2-2302597](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302597.zip), R[2-2302666](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302666.zip), R[2-2302667](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302667.zip), R2-2303106, R[2-2303107](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303107.zip), R[2-2304096](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304096.zip), R[2-2304091](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304091.zip), R[2-2304092](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304092.zip), R[2-2302771](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302771.zip), R2-2304138, R[2-2304140](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304140.zip), R[2-2303871](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303871.zip), R[2-2303872](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303872.zip)
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) |
| Ericsson | Oskar Myrberg (oskar.myrberg@ericsson.com) |
| Qualcomm Inc | Mouaffac (mambriss@qti.qualcomm.com)  |
| OPPO | fanjiangsheng@oppo.com |
| CATT | zhangbufang@catt.cn |
| Sequans | Olivier Marco (omarco@sequans.com) |
| NEC | hisashi.futaki @ nec.com |
| T-Mobile USA | John Humbert (John.Humbert2@T-Mobile.com) |
| Intel | Sudeep.k.palat@intel.com |
| vivo | wenjuan.pu@vivo.com |
| LGE | SungHoon Jung (sunghoon.jung@lge.com) |

# 3. Discussion

## 3.1 [R15] Recommended bit rate query

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| R[2-2302595](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302595.zip) 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-CoreR[2-2302596](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302596.zip) 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-CoreR[2-2302597](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302597.zip) 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**

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| 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; and2> 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?**

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| --- | --- | --- | --- |
| 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.[Samsung]: Agree that *bitRateQueryProhibitTimer*, if configured for a logical channel can be applied for both DL and UL direction of that logical channel.We have added text in field description to clarify this point.If logical channel is DL only, how can network signal *bitRateQueryProhibitTimer?* LogicalChannelConfig -> ul-SpecificParameters can not be signaled for logical channel with no UL. Can you clarify your understanding? |
| 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.[Samsung]: If logical channel is DL only, how can network signal *bitRateQueryProhibitTimer?* LogicalChannelConfig -> ul-SpecificParameters can not be signaled for logical channel with no UL. Is your suggestion to clarify in condition UL that: network is allowed to/can signal, LogicalChannelConfig -> ul-SpecificParameters🡪 *bitRateQueryProhibitTimer* for a logical channel with DL only*.* |
| 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.[Samsung]: For my clarification, your understanding is that DL only case is not supported in R15. There is no need to introduce changes to support it, as it is not essential. |
| 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.[Samsung]: For my clarification, your understanding is that DL only case is not supported in R15. There is no need to introduce changes to support it, as it is not essential. |
| 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.  |
| Ericsson | N | N | This CR adds functionality by the addition of an additional timer for the DL, and therefore can not be accepted as we see it. The fact that it was outside the ul-SpecificParameters for LTE does not change anything for NR in our opinion. It is our belief that the reason for the *bitRateQueryProhibitTimer* is placed in the ul-SpecificParameters in NR is because it relates to sending MAC CEs query in the UL, but the timer can be applied independently for both directions.[Samsung]: Agree that *bitRateQueryProhibitTimer*, if configured for a logical channel can be applied for both DL and UL direction of that logical channel.We have added text in field description to clarify this point.If logical channel is DL only, how can network signal *bitRateQueryProhibitTimer?* LogicalChannelConfig -> ul-SpecificParameters can not be signaled for logical channel with no UL. Can you clarify your understanding?[Ericsson 19th April ] If the logical channel is downlink only then there would be no reason for a bitRateQuery at all since the gNB will set the bitrate for the DL channel. Furthermore, if there is no uplink configured then there is no MAC CE to use for the bitRateQuery so we think this case of DL only is not applicable. |
| Nokia, Nokia Shanghai Bell | No | No | We shouldn’t add new aspects to frozen features. This change seems to intended for DL adaptation, i.e. UE indicating MAC CE towards network. Further, the change itself is referring to “logical channel without uplink.”, which just means that this feature cannot be used for RLC-UM cases with only DL.  |
| NEC | Yes | Maybe | We understand the observation from Samsung looks correct, although the comments from other companies could be also understood. In any case, the current spec does not reflect the actual intention, so we are fine to either agree with the proposal or remove the problematic wording in the MAC spec as proposed by Xiaomi (if it’s confirmed sufficient). |
| Intel | No | No | We should not read too much into the location of the field in the UL parameter list. It is not a critical error to solve in this way, given the specs was frozen long ago and this is an ASN.1 impacting change, If any change is necessary, some clarification of the existing field can be considered that it is applicable for DL and UL.  |
| vivo | No | No | Firstly, we agree that new changes can’t be added to the frozen features.Then, we think if the DL-only case is valid in the real deployment, only the clarification can be added in the field description to include DL only case. |
| LGE | Partially | No | We agree with the observation in the CR that the bitRateQueryProhibitTimer is currently in the ul-SpecificParameters, and cannot be configured to DL-only logical channel.However, for DL-only logical channel, the network controls the bit rate, and there is no need to query the DL bit rate. |

**Rapporteur summary on Q1**

Companies agree with observation that as per the current specification bitRateQueryProhibitTimer can not be configured for DL only logical channel. However, most of the companies thinks that it is not essential to support this feature for DL only logical channel.

**Proposal 1: CRs R**[**2-2302595**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302595.zip)**/ R**[**2-230259**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302595.zip)**6/ R**[**2-230259**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302595.zip)**7 are not pursued.**

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

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| R[2-2302666](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302666.zip) Clarifications on CG Parameters in NR-U vivo CR Rel-16 38.331 16.12.0 3958 - F NR\_unlic-CoreR[2-2302667](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302667.zip) Clarifications on CG Parameters in NR-U vivo CR Rel-17 38.331 17.4.0 3959 - A NR\_unlic-Core |

**Reason for change**

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

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| 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. |
| Ericsson | Y | **Y** |  |
| Nokia, Nokia Shanghai Bell | Yes | **Yes but** | We could just add reference to RAN1 and that would be sufficient?  |
| Qualcomm Inc | Yes | Yes |  |
| Intel | Yes | Yes |  |
| vivo | Yes | Yes |  |
| LGE | Neutral | Neutral | Not essential.2nd and 3rd change seems editorial. |
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**Rapporteur summary on Q2**

Companies agree with the intention of CR. However, few companies (3) have expressed the views that changes are not essential. Based on significant majority supporting the clarification, Rapporteur’s suggestion is to discuss the changes (agree the text as it is or just add a reference to RAN1 spec) in phase 2.

**Proposal 2: For R2-2302666/R**[**2-2302667**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302667.zip)**,** **discuss the changes (i.e. agree the text as it is or just add a reference to RAN1 spec) in phase 2.**

## [R16 NR-U] RSSI measurement frequency

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| R[2-2303106](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303106.zip) Clarification on RSSI measurement frequency Samsung R&D Institute India CR Rel-16 38.331 16.12.0 3983 - F NR\_unlic-CoreR[2-2303107](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303107.zip) 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**

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| 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?**

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| 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. |
| Ericsson | Y | Y |  |
| Nokia, Nokia Shanghai Bell | Yes | No strong view | We agree with the intent but don’t really see a possibility for misinterpretation here (as Huawei indicated, this is already clear from procedural text9 |
| Qualcomm Inc | Yes | Yes |  |
| NEC | Yes | Yes |  |
| Intel | Yes | Yes |  |
| vivo | Yes | Yes |  |
| LGE | Neutral | Neutral | We think there is no ambiguity in the current specification. |

**Rapporteur summary on Q3**

9/11 companies agree with the intention of CR. However, few companies (3) have expressed the views that changes are not essential. Based on significant majority supporting the clarification, Rapporteur’s suggestion is to discuss the refinement of changes (based on comments received on text proposal in phase 1) in phase 2.

**Proposal 3: For R**[**2-2303106**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303106.zip)**/R**[**2-230310**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303106.zip)**7, discuss the refinement of changes (based on comments received on text proposal in phase 1) in phase 2.**

## [R15] Security

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| R[2-2304096](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304096.zip) Clarification on the update of security algorithms Ericsson discussion Rel-15 NR\_newRAT-Core  |

**Discussion**

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| 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.

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| *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 | N | **a** | The security algorithm needs be provided at time of setup of SRB/DRB. But this does not mean that security algo is changed. |
| 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. |
| Nokia, Nokia Shanghai Bell | Maybe | **a** **(b could also be possible but requires more checking)** | This is an interesting point: a is the obvious way since UE and NW have no other way of knowing which packets use which algorithm otherwise. But for the same reason, option b could perhaps also work but we are not sure it works without any changes. |
| Qualcomm Inc | No | **a** | Procedural text is clear that Reconfig with sync is required if network desires to change the security algorithm. |
| Ericsson (Tony) | Y | **a** | We also believe that reconfiguration with sync is the safiest way for changing the security algorithms.Also, for the optionality of the security algorithm, we want to make sure that if the network repeat the security algorithm the UE does not interpret this as an invalid configuration. Good if we can confirm this understanding. |
| CATT | N | **a/b** | The sentence in normal text procedure is clearOption a) can work for all cases. Option b) also can be used for case of ”change of termination point for the radio bearer between MN and SN” |
| Sequans | N | **a** | Similar view as HW, spec is 100% clear, and it’s not because ASN.1 authorizes some field setting that they are valid (especially when explicitly forbidden in procedural text).  |
| NEC | Y | a | We are not sure if there is real issue, as the field description does not say the security algorithm can be changed. However, we agree that it may cause confusion and it’s good to confirm. |
| Intel | N | a | There is no contradiction in the current specification. The specs are clear that it can be changed only with reconfig with sync as also captured in the document. The condition on optional inclusion does not have to list all the cases where is included (mandatory cases had to be included due to the “otherwise” for optional presence). |
| vivo | N | a | The *securityAlgorithmConfig* IE can be included in many cases as the field description, but the security algorithm can only be changed by reconfigurationWithSync. Therefore, the current spec is clear and no need to change the spec. |
| LGE | N | **a** | We don’t see any conflict or other possibility to change security key without reconfiguration with sync, according to the current spec.  |
|  |  |  |  |

**Rapporteur summary on Q4**

13/15 companies agree that as per the current spec the security algorithms at the UE can only be changed with reconfiguration with sync (for both SRBs and DRBs). Two companies thinks that option b may also be used.

Proposal 4: RAN2 confirms that the security algorithms at the UE can only be changed with reconfiguration with sync (for both SRBs and DRBs).

## nas-SecurityParamFromNR

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| --- |
| R[2-2304091](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304091.zip) Clarification on nas-SecurityParamFromNR field description Ericsson CR Rel-16 38.331 16.12.0 4052 - A NR\_newRAT-CoreR[2-2304092](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304092.zip) 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]”. |
| Nokia, Nokia Shanghai Bell | Yes | **Yes** | Since this originated from us in the previous meeting (and we were planning to submit the document to May meeting), we obviously agree with the intention. We are also happy to co-sign the CRs if they are agreeable by all.  |
| Quaclomm Inc | Yes |  | editorial change and can be added to the rapporteur CR |
| Ericsson (Tony) | Yes | **Yes** | As stated in the CR coverpage, the field description of NR is aligned to what we have already in LTE. This may be the simpliest way to clarify this without adding any complicated text. |
| Sequans | Yes | **Yes with comments** | 1) We think the **and** in current text “deliver key sync and key freshness **and** part of DL NAS COUNT” is misleading because the field will actually just contain part of DL NAS COUNT (which is what is used for key sync and key freshness).There is no such issue in LTE wording (it didn’t say part of dl NAS COUNT).We proposed below wording at last meeting to solve this, also it would solve “and and” and is more compact:***nas-SecurityParamFromNR***If *targetRAT-Type* is *eutra*, this field is used to deliver the key synchronisation and Key freshness for the NR to LTE/EPC handovers ~~and~~ It contains a part of the downlink NAS COUNT asspecified in TS 33.501 [11] and TS 24.501 [23].. If *targetRAT-Type* is *utra-fdd*, this field is used to deliver the key synchronisation and Key freshness for the NR to FDD UTRAN handover ~~and~~ It contains apart of the downlink NAS COUNT as specified in TS 33.501 [11] and TS 24.501 [23].2) Also as commented earlier, we don’t think 24.501 says anything about the container in the case of 5G to 3G SRVCC. There is “N1 mode to S1 mode NAS transparent container” for 5GS to EPS, but it is a stretch to understand this should also be used for 5G to 3G (?).So it would be nice if the proponents also update 24.501 since the CR point to that spec now…E.g. in LTE to 3G case, it is correctly specified in 24.301 “During the handover from E-UTRAN to UTRAN/GERAN the MME signals the current downlink NAS COUNT value in a NAS security transparent container (see subclause 9.9.2.6).”. |
| NEC | Y | Y | If we understand correctly, should we refer to the CR in R2-2304090 (for Rel-15)? Or is it already assumed to go from Rel-16?  |
| Intel | Y | May be | We don’t think this is essential to clarify – it has been like this since R15 and there are no reported interoperability issues. The behaviour is clear from other specifications. If a change is to be agreed, the proposed text in the CR seems good. In RAN2 specs, we should not refer to RAN3 containers as suggested by other companies. If such mapping needs to be captured, it should be in RAN3 spec. It is OK to refer to CT1 NAS spec (24.501) as in the CR.  |
| vivo | Y | Y |  |
| LGE | Neutral | **Neutral** | Seems not essential |
|  |  |  |  |

**Rapporteur summary on Q5**

13/14 companies agree with the intention of CR. However, few companies have expressed the views that changes are not essential. Rapporteur’s suggestion is to discuss the refinement of changes based on the comments in phase 2.

**Proposal 5: For R**[**2-2304091**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303106.zip)**/ R**[**2-230409**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303106.zip)**2, discuss the refinement of changes (based on comments received on text proposal in phase 1) in phase 2.**

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

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| --- |
| R[2-2302771](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302771.zip) CSI-RS resource coordination in NR-DC Nokia, Nokia Shanghai Bell discussion Rel-15 NR\_newRAT-CoreR[2-2304138](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304138.zip) CSI-RS resource coordination in NR-DC Nokia, Nokia Shanghai Bell CRRel-16 38.331 16.12.0 3990 2 F NR\_newRAT-Core, TEI16 R[2-2304133](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304133.zip)R[2-2304140](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304140.zip) 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 R[2-2304135](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2304135.zip) |

**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. |
| Ericsson | Not sure | **N** | * It does not seem the MN needs to limit the capabilities defined per CC, since either MN or SN would configure them, so the inter-node message signaling could be simplified to coordinate only the UE parameters in csi-RS-IM-ReceptionForFeedbackPerBandComb and simultaneousSRS-AssocCSI-RS-AllCC.
* The wording “per CG” seems to hint that the MN is informing the SN how many resources it intends to configure, while the SN could indicate how many it actually configure (in that way, if any resources are left, the MN can still configure additional resources). Is that the intention? If yes, we may need some rewording to clarify it.
 |
| Nokia, Nokia Shanghai Bell | Yes (proponent) | Yes (proponent) | Just to clarify: Several/most CSI-RS capabilities are both per-CC and per-UE. For example, UE might support up to 5 CSI-RS resources per-UE and 2 per-CC. Network has to ensure both limitations are followed, but this is currently not possible as neither MN nor SN knows what the other has configured. That’s why we proposed to coordinate the resources.As for the exact capabilities coordinated, what we show were the most immediate concerns. We are fine to coordinate also other capabilities if seen needed. In general we are also fine to continue discussing the exact wording that suits all. |
| OPPO | Maybe | No | We think this is not a big issue as R15 survives for quite long time, no serious problem was found; Even if this problem may happen, we still have OAM based solution to minimize the spec impact. |
| CATT | Yes | No strong view |  |
| NEC | Y | Y, basically | It seems valid observations, although we can follow majority views.Some small editorial issues. Most parameters are explained as “resources per CG” in the *CSI-RS-ResourceUsage* field description, while the intention would be “for SCG”. Renaming can be considered?For *maxSimultaneousSRS-AssocCSI-RS-PerCG*, it is explained as “SN can use simultaneously across the CG”. We are wondering if it should be “for SCG” like other parameters? |
| T-Mobile USA | Yes | Will support majority opinion |  |
| Intel | Yes | Yes in principle | OK to consider this as a baseline for further discussion. |
| vivo | Yes | No strong view | For allCC capabilities, the MN-SN coordination maybe needed, otherwise, the MCG and SCG configuration may exceed the UE capabilities. Need further check with RAN1 collegues.  |
| LGE | Yes | No strong view | We understand that UE capabilities may be underutilized without CSI-RS capability coordination. But the required level of coordination needs further discussion.  |
|  |  |  |  |

**Rapporteur summary on Q6**

9/14 companies agree with intention. Regarding the changes, 3 companies agree, 4 companies do not agree with the changes and 7 companies have no strong view/not sure about the proposed changes. Rapporteur’s view is that it seems difficult to agree these changes in this meeting and suggest to postpone the discussion to next meeting.

## [R16] reconfiguration including T316

|  |
| --- |
| R[2-2303871](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303871.zip) Correction on reconfiguration including T316 Lenovo CR Rel-16 38.331 16.12.0 4029 - F LTE\_NR\_DC\_CA\_enh-CoreR[2-2303872](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303872.zip) 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**

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| --- |
| 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. |
| Nokia, Nokia Shanghai Bell | Yes (see comments) | **No (not needed)** | We agree with Huawei and would like to add that the procedural text handling T316 covers all the cases already. So while the intent of the CR is correct, we don’t think it is needed. |
| Qualcomm Inc | Yes | **No strong view** | Agree it’s missing in the procedure description however it's clear from the ASN.1, as it's SetupRelease type IE |
| CATT | NO | **NO** | It is not essential, and it is clear how to handle the setupRelease type IE. And in the normal text it is clear whether MCG failure information could be initiated in 5.7.3b.2:A UE configured with split SRB1 or SRB3 initiates the procedure to report MCG failures when neither MCG nor SCG transmission is suspended, the SCG is not deactivated, *t316* is configured, and when the following condition is met:1> upon detecting radio link failure of the MCG, in accordance with 5.3.10.3, while T316 is not running. |
| NEC | No | **No** | Agree with previous comments. As there seems to be almost no room to misunderstand, it looks not super critical. |
| Intel | Yes | **Not needed** | We agree with the intention but don’t see this CR as needed. The intended behaviour should be clear. While we have captured this in the procedural section for some cases, we don’t think it was necessary. |
| vivo | Yes | **No strong view** | The usage of SetupRelease type IE is clear from the ASN.1 guidance. If this is agreed, can be merged to rapporteur CR.  |
| LGE | Acceptable  | **No** | We think according to 5.1.2, it is clear that T316 is configured if the field is set to setup with a value or T316 is deconfigured, if set to release.  |
|  |  |  |  |

**Rapporteur summary on Q7**

7/13 companies thinks that the change is not needed. 4 companies have no strong view and are ok to follow majority.

**Proposal 6: CRs R**[**2-2303871**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303871.zip)**/ R**[**2-230387**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303871.zip)**32 are not pursued.**

# 3. Conclusions

**Proposal 1: CRs R**[**2-2302595**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302595.zip)**/ R**[**2-230259**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302595.zip)**6/ R**[**2-230259**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302595.zip)**7 are not pursued.**

**Proposal 2: For R2-2302666/R**[**2-2302667**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2302667.zip)**,** **discuss the changes (i.e. agree the text as it is or just add a reference to RAN1 spec) in phase 2.**

**Proposal 3: For R**[**2-2303106**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303106.zip)**/R**[**2-230310**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303106.zip)**7, discuss the refinement of changes (based on comments received on text proposal in phase 1) in phase 2.**

**Proposal 4: RAN2 confirms that the security algorithms at the UE can only be changed with reconfiguration with sync (for both SRBs and DRBs).**

**Proposal 5: For R**[**2-2304091**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303106.zip)**/ R**[**2-230409**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303106.zip)**2, discuss the refinement of changes (based on comments received on text proposal in phase 1) in phase 2.**

**Proposal 6: CRs R**[**2-2303871**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303871.zip)**/ R**[**2-230387**](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2023%5CRAN2%20121b%5CR2-2303871.zip)**32 are not pursued.**