3GPP TSG-RAN WG2 Meeting #115 Electronic R2-210xxxx

Online, Aug 16th – Aug 27th, 2021

**Agenda item: 5.4.1.1**

**Source: vivo**

**Title: Draft-Summary of [AT115-e][013][NR15] Connection Control II (vivo)**

**Document for: Discussion and Decision**

# 1 Introduction

This document is a report on the following email discussion:

* [AT115-e][013][NR15] Connection Control II (vivo)

 Scope: Determine agreeable parts in a first phase, for agreeable parts agree on CRs. Treat R[2-2107375](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2107375.zip), R[2-2107376](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2107376.zip), R2-2108811, R2-2108812, R[2-2108185](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2108185.zip), R2-2108186, R[2-2107836](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2107836.zip), R2-2107837, R2-2107570,

 Intended outcome: Report, agreed CRs if applicable

 Deadline: Schedule 1

The deadline Schedule 1 for this email discussion is copied from Chair notes:

* A first round with Deadline for comments Thursday Aug 19 1200 UTC to settle scope what is agreeable etc
* A Final round with Final deadline Thursday Aug 26 1200 UTC. to settle details / agree CRs etc. Additional check points etc if needed are defined by the Rapporteur.
* In case some parts of an email discussion need more time, doesn’t converge, need on-line treatment etc Rapporteur please contact chair.

This document summarizes the following contributions from Agenda Item 5.4.1.1 Connection control:

[1] R2-2107375 38331 Clarifications on full configuration-R15 OPPO CR Rel-15 38.331 15.14.0 2719 - F NR\_newRAT-Core

[2] R[2-2107376](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2107376.zip) 38331 Clarifications on full configuration-R16 OPPO CR Rel-16 38.331 16.5.0 2720 - A NR\_newRAT-Core

[3] R2-2108811 Correction on reconfigurationWithSync Huawei, HiSilicon CR Rel-15 38.331 15.14.0 2798 - F NR\_newRAT-Core

[4] R2-2108812 Correction on reconfigurationWithSync Huawei, HiSilicon CR Rel-16 38.331 16.5.0 2799 - A NR\_newRAT-Core

[5] R[2-2108185](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2108185.zip) Clarification on NR SCG reconfiguration with sync in LTE Ericsson CR Rel-15 36.331 15.14.0 4707 - F NR\_newRAT-Core

[6] R[2-2108186](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2108186.zip) Clarification on NR SCG reconfiguration with sync in LTE Ericsson CR Rel-16 36.331 16.5.0 4708 - A NR\_newRAT-Core

[7] R[2-2107836](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2107836.zip) Correction on the Need for SCG Reconfiguration with Sync in (NG)EN-DC vivo CR Rel-15 36.331 15.14.0 4698 - F NR\_newRAT-Core

[8] R[2-2107837](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2107837.zip) Correction on the Need for SCG Reconfiguration with Sync in (NG)EN-DC vivo CR Rel-16 36.331 16.5.0 4699 - A NR\_newRAT-Core

[9] R[2-2107570](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2107570.zip) Clarification on LTE HO without SCG Configuration Change Apple discussion Rel-16 NR\_newRAT-Core

# 2 Contact Points

Respondents to the email discussion are kindly asked to fill in the following table.

|  |  |  |
| --- | --- | --- |
| Company | Name | Email Address |
| vivo(rapporteur) | Annie Zhong | Tingting.zhong@vivo.com |
| Qualcomm | Mouaffac Ambriss | mambriss@qti.qualcomm.com |
| Nokia |  | amaanat.ali@nokia.com |
| MediaTEk | Felix Tsai | Chun-fan.tsai@mediatek.com |
| Ericsson | Antonino Orsino | antonino.orsino@ericsson.com |
| OPPO | Jiangsheng Fan | fanjiangsheng@oppo.com |
| Intel | Sudeep K Palat | sudeep.k.palat@intel.com |
| ZTE | Huang He | Huang.he4@zte.com.cn |
| NEC | Hisashi Futaki | hisashi.futaki[at] nec.com |
| Apple | Yuqin Chen | yuqin\_chen@apple.com |
| CATT | Jing Liang | liangjing@catt.cn |

# 3 Discussion

## 3.1 Full configuration

This topic is from the following two contributions.

[1] R[2-2107375](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2107375.zip) 38331 Clarifications on full configuration-R15 OPPO CR Rel-15 38.331 15.14.0 2719 - F NR\_newRAT-Core

[2] R2-2107376 38331 Clarifications on full configuration-R16 OPPO CR Rel-16 38.331 16.5.0 2720 - A NR\_newRAT-Core

Two contributions above mention that,

* According to section 5.3.5.11 in TS38.331, when full configuration is received, UE shall release the DRBs associated to each PDU session that is a part of current configuration. The PDU session is released if the same PDU session is not added by drb-ToAddModList.
* In RRC resume procedrue, the full configuration indication can be included in RRCResume message while drb-ToAddModList is optional present. Therefore, if there is no drb-ToAddModList included in RRCResume, all DRBs will be released but SRB2 is present, which is not supported.
* drb-ToAddModList is modified to be mandatory present when the fullConfig is included in the RRCResume.

**Question 1: Do companies think the issue mentioned by two contributions above should be addressed?**

|  |  |  |
| --- | --- | --- |
| Company | Yes or No | Comments |
| QCOM | Yes |  |
| MediaTek | Maybe | It is also our understanding that DRBToAddMod should be present in case of *RRCResume* with full configuration. We have no strong view whether this clarification is needed or not. We assume that this is already current network behavior. Anyway, fine to clarify this. |
| Nokia | No | We think the NOTE 3 in section 5.3.5.11 is sufficiently clear and says specifically "the DRB re-setup" Looks like the CR tries to cover a bad network implementation but this should be already clear enough? |
| Ericsson | No | Our understanding is that there is no issue with the current specification and the problem that is tackled by this CR is due to a bad network implementation. However, we usually don’t accommodate bad network implementation and we don’t see the point to have this change now. |
| OPPO | Yes | We agree that this case can be avoided by smart network implemention, but we think it is beneficial to make a clarification on this issue so that an unsupported case can be precluded from specification perspective. |
| Intel | Yes | While it should be reasonably clear to an implementation that DRBs should be setup after a full configuration, since the other cases are included, it is better to also include this one to avoid misunderstanding. |
| Huawei, HiSilicon | Acceptable to us |  |
| ZTE | Maybe | We agree the intention, but we have no strong view since it is some kind of bad NW implementation and there is no issue in current NW. |
| NEC | Yes |  |
| Apple | Yes | We are fine to clarify in the spec. |
| CATT | Yes |  |
|  |  |  |

**Question 2: If the answer to Question 1 is Yes, do companies agree with spec changes([1], [2])?**

|  |  |  |
| --- | --- | --- |
| Company | Agree or not? | Comments |
| QCOM | Yes |  |
| MediaTek | Maybe | See comments in Q1. |
| Nokia | No | See comments in Q1. |
| Ericsson | No | See comments in Q1. |
| OPPO | Yes |  |
| Intel | Yes |  |
| Huawei, HiSilicon | Yes |  |
| ZTE | Yes |  |
| NEC | Yes |  |
| Apple | Yes |  |
| CATT | Yes |  |
|  |  |  |

## 3.2 Reconfiguration With Sync

In RAN2#114e meeting, R2-2105090 proposed that according to the LTE RRC spec description below, in EN-DC handover, NW is mandatory to provide the reconfigurationWithSync in SCG configuration regardless of whether SCG configuration is changed or not.

|  |
| --- |
| 5.3.1.3 Connected mode mobility……Before sending the handover message to the UE, the source eNB prepares one or more target cells. The source eNB selects the target PCell. The source eNB may also provide the target eNB with a list of best cells on each frequency for which measurement information is available, in order of decreasing RSRP. The source eNB may also include available measurement information for the cells provided in the list. The target eNB decides which Scells are configured for use after handover, which may include cells other than the ones indicated by the source eNB. If an SCG is configured, handover involves either SCG release or either SCG change (in case of DC) or an NR SCG reconfiguration with sync and key change (in case of EN-DC and NGEN-DC). In case the UE was configured with (EN-) DC or NGEN-DC, the target eNB indicates in the handover message whether the UE shall release the entire (NR) SCG configuration. Upon connection re-establishment, the UE releases the entire SCG configuration except for the DRB configuration, while E-UTRAN in the first reconfiguration message following the re-establishment either releases the DRB(s) or reconfigures the DRB(s) to MCG DRB(s).…… |

However, in the 114e-AT005 email discussion, many companies thought that from TS 38.331 it is already clear when the reconfiguration with sync should be signalled in the secondary cell group as the specification below. Besides, they thought the reason why there is some misalignment between the LTE and NR specification perhaps is that the conditions in the NR spec were updated after the LTE specification text was written.

|  |  |
| --- | --- |
| **Conditional Presence** | **Explanation** |
| *ReconfWithSync* | The field is mandatory present in the *RRCReconfiguration* message:- in each configured *CellGroupConfig* for which the SpCell changes,- in the *masterCellGroup* at change of AS security key derived from KgNB,- in the *secondaryCellGroup* at:- PSCell addition,- SCG resume with NR-DC or (NG)EN-DC,- update of required SI for PSCell,- change of AS security key derived from S-KgNB while the UE is configured with at least one radio bearer with *keyToUse* set to *secondary* and that is not released by this *RRCReconfiguration* message,Otherwise, it is optionally present, need M. The field is absent in the *masterCellGroup* in *RRCResume* and *RRCSetup* messages and is absent in the *masterCellGroup* in *RRCReconfiguration* messages if source configuration is not released during DAPS handover. |

NOTE: In case of change of AS security key derived from S-KgNB/S-KeNB, if *reconfigurationWithSync* is not included in the *masterCellGroup*, the network releases all existing MCG RLC bearers associated with a radio bearer with *keyToUse* set to *secondary*. In case of change of AS security key derived from KgNB/KeNB, if *reconfigurationWithSync* is not included in the *secondaryCellGroup*, the network releases all existing SCG RLC bearers associated with a radio bearer with *keyToUse* set to *primary*.

The final agreement for this topic was “Postpone discussion on whether the reconfigurationWithSync in SCG configuration is mandatory for the LTE handover with NR PSCell in EN-DC” in RAN2#114e meeting. Therefore, there are several contributions related to this issue in RAN2#115e meeting as follows.

[3] R2-2108811 Correction on reconfigurationWithSync Huawei, HiSilicon CR Rel-15 38.331 15.14.0 2798 - F NR\_newRAT-Core

[4] R2-2108812 Correction on reconfigurationWithSync Huawei, HiSilicon CR Rel-16 38.331 16.5.0 2799 - A NR\_newRAT-Core

[5] R2-2108185 Clarification on NR SCG reconfiguration with sync in LTE Ericsson CR Rel-15 36.331 15.14.0 4707 - F NR\_newRAT-Core

[6] R[2-2108186](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2108186.zip) Clarification on NR SCG reconfiguration with sync in LTE Ericsson CR Rel-16 36.331 16.5.0 4708 - A NR\_newRAT-Core

[7] R2-2107836 Correction on the Need for SCG Reconfiguration with Sync in (NG)EN-DC vivo CR Rel-15 36.331 15.14.0 4698 - F NR\_newRAT-Core

[8] R[2-2107837](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2107837.zip) Correction on the Need for SCG Reconfiguration with Sync in (NG)EN-DC vivo CR Rel-16 36.331 16.5.0 4699 - A NR\_newRAT-Core

[9] R[2-2107570](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2107570.zip) Clarification on LTE HO without SCG Configuration Change Apple discussion Rel-16 NR\_newRAT-Core

Referring to contributions above, there are two different options proposed by companies’ contributions for this topic :

* Option A: NR SCG reconfigurationWithSync configuration is mandatory present for (NG)EN-DC handover, and NR spec is updated;
* Option B: NR SCG reconfigurationWithSync configuration isn’t mandatory present for (NG)EN-DC handover, and LTE spec is updated.

**Question 3: Which option do companies prefer?**

|  |  |  |
| --- | --- | --- |
| Company | Preferred option | Comments |
| QCOM | Please check notes | Options statements and CRs are not fully aligned, so to avoid confusion, we will explicitly mention the preferred option:**-Change the NR spec to mandate the Reconfig with Sync upon MCG HO.** |
| MediaTek | Option A | Slightly prefer option A to avoid any potential IOT issue |
| Nokia | Option A | Firstly companies need to all agree that for every case of LTE HO (intra eNB or inter eNB) the LTE security keys are updated and hence NR SCG is forced to undergo reconfiguration with sync. If this is not the common understanding we are already in trouble with IODT.It would be good to confirm the above before discussing any CRs (we don’t think the CRs today are aligned with this understanding) |
| Ericsson | See comments | The current conditional presence of *ReconfWithSync* in the NR specification, that was changed in after the LTE specification, allows the network to not provide the reconfiguration with sync when all SCG radio bearer are MN terminated bearers.We agree that the LTE mandate that reconfiguration with sync is always used in case of LTE HO, but we think that the IODT problem (may) is already there.According to this, we want to encourage everybody to check they implementation so that we can come up with a solution that (hopefully) will make everybody happy.Along these line, maybe we can move this to a post email discussion? |
| OPPO | Option A | But we’re also fine to have the common understanding that ‘every case of LTE HO (intra eNB or inter eNB), the LTE security keys are updated’ as mentioned by Nokia. |
| Intel | Option A | LTE specification was done before the NR was updated. NR is technically not incorrect as reconfig with sync is not essential. Then, it comes to what implementations support today. Since majority prefer option A, and it is the safer option, we prefer option A for Rel-15.  |
| Huawei, HiSilicon | Option A | proponent |
| ZTE | Option A | Although option B is feasible as well, considering the option B has not been well tested by UE, option A seems a safer way to go. |
| NEC | Option A | we prefer A, as this is simpler. Also, we do not see critical issue with this direction. |
| Apple | Option A | Prefer Option A to avoid IOT issue.  |
| CATT | Option A | Option A seems simpler. |
|  |  |  |

**Question 4: If the answer to Question 3 is Option A, do companies have any comments on spec changes([3], [4], [9]\_Option 1)?**

|  |  |  |
| --- | --- | --- |
| Company | Agree or not? | Comments |
| QCOM | Please check notes | We support HW CR (R[2-2108811](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2108811.zip) & R2-2108812) … worth to mention that the spec number of these CRs is not 36.331, rather 38.331.  |
| MediaTek |  | HW CR (R[2-2108811](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2108811.zip) & R[2-2108812](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2108812.zip)) looks okay to us. The coversheet should be revised as mentioned by QC. |
| Nokia |  | First we would like common understanding to be confirmed |
| Ericsson |  | Check implementations first and then decide with direction to go. |
| OPPO |  | HW CR(R[2-2108811](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2108811.zip) & R2-2108812) can be a way forward if we have the above common understanding. |
| Huawei, HiSilicon |  | Proponent of R[2-2108811](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2108811.zip) /R2-2108812 |
| ZTE |  | CR from HW seems fine for us. |
| NEC | See comment | prefer to go with Option 1 of [9]. Can discuss a wording, e.g. whther “LTE HO” or “EUTRA HO”?For [3][4], they are confuing, because the changes look like to support Option B, i.e. it can be understood that only when the S-KgNB has been used and is to be updated, the reconfigurationWithSync is configured. The cover page and actual changes would not be so aligned with some interpretation of the new text.  |
| Apple |  | Our understanding is the condition should be “S-KgNB is changed due to LTE HO”. Huawei CR may miss the case where SCG is configured but without SN terminated DRB/SRB3. For example, if there are only MN terminated bearers, “change of AS security key derived from S-KgNB” would not happen.Thus, we prefer using a clearer text like “LTE HO with EN-DC”. |
| CATT |  | We support HW CR[3][4] |
|  |  |  |

**Question 5: If the answer to Question 3 is Option B, do companies have any comments on spec changes([5], [6],[7], [8], [9]\_Option 2)?**

|  |  |  |
| --- | --- | --- |
| Company | Agree or not? | Comments |
| QCOM | Please check notes | We support HW CR (R2-2108811 & R[2-2108812](file:///E%3A%5C3GPP%E6%96%87%E6%A1%A3%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E7%A8%BF%5C2021%5CRAN2%20115_e%5CR2-2108812.zip)) … worth to mention that the spec number of these CRs is not 36.331, rather 38.331.  |
| Nokia |  | First we would like common understanding to be confirmed |
| Ericsson | Yes but | We are open to go for a solution that is compatible with current implementations. |
| ZTE |  | If there is no IOT issue for option B, which need to be confirmed by UE vendor, then we are also fine with option B. |
|  |  |  |
|  |  |  |

Further, in the 114e-AT005 email discussion, some companies thought that if reconfigurationWithSync is not included, then SCG MAC/RLC will not reset. In this case, to avoid UE to deliver the old data (with old key) to CN, one possible way is to configure new LCHs associated with the bearers, and discard the data received from old LCH. RLC bearers can be released and added. In rapporteur’s view, according to the quoted TS38.331 spec above“In case of change of AS security key derived from KgNB/KeNB, if reconfigurationWithSync is not included in the secondaryCellGroup, the network releases all existing SCG RLC bearers associated with a radio bearer with keyToUse set to primary.” ,the current TS38.331 has already solved this issue. As for whether the new RLC bearers are added by network, it is network’s behavior and the better way is up to network’s implementation.

**Question 6: If the answer to Question 3 is Option B, do companies agree that it is up to network’s implementation to avoid UE to deliver the old data (with old key) to CN if NR SCG reconfigurationWithSync is not included?**

|  |  |  |
| --- | --- | --- |
| Company | Agree or not? | Comments |
| Nokia | Agree | The LTE HO already forces a key change so this should be business as usual? |
| Intel | Agree | It can be done by RLC bearer release and add can be used if option B is to be considered. |
| ZTE | Agree |  |
| NEC | Agree | if Option A, it is network responsibility to ensure reconfigurationWithSync for SCG. No need to capture error case handling from UE point of view. |
|  |  |  |
|  |  |  |

# 4 Conclusion

TBD.