3GPP TSG-RAN WG2 #117-e R2-220xxxx

Electronic meeting, 21st February – 3rd March 2022

Agenda Item: 5.4.1

Source: Ericsson

Title: [AT117-e][027][NR15] RRC misc I (Ericsson)

Document for: Discussion

# Introduction

This contribution treats the following offline discussion during RAN2#117 meeting.

* [AT117-e][027][NR15] RRC misc I (Ericsson)

Scope: Treat R2-2202106, R2-2202272, R2-2202273, R2-2202393, R2-2203498, R2-2203499, R2-2203335, R2-2203336

Ph1 Determine agreeable parts, Ph2 For agreeable parts, progress CRs.

Intended outcome: Report, Agreed CRs

Deadline: Schedule 1

A **first round** with **Deadline for comments W1 Thur Feb 24th 1200 UTC** to settle scope what is agreeable etc

A Final round with **Final deadline W2 Wed March 2nd 1200 UTC** to settle details / agree CRs etc.

In the first phase, the discussion would be around what are agreeable parts of the CRs.

To aid the discussion amongst the delegates, please include the company name and the corresponding delegate name and email address in the table below.

|  |  |  |
| --- | --- | --- |
| **Company name** | **Delegate name** | **Email address** |
| ZTE | LiuJing | liu.jing30@zte.com.cn |
| Qualcomm | Mouaffac | [mambriss@qti.qualcomm.com](mailto:mambriss@qti.qualcomm.com) |
| vivo | Boubacar Kimba | kimba@vivo.com |
| Nokia | Amaanat Ali | amaanat.ali@nokia.com |
| Ericsson | Pradeepa Ramachandra | pradeepa.ramachandra@ericsson.com |
| OPPO | Shukun Wang | wangshukun@oppo.com |
| Samsung | Sangbum Kim | sb07.kim@samsung.com |
| MediaTek | Felix Tsai | chun-fan.tsai@mediaTek.com |
| Apple | Zhibin Wu | zhibin\_wu@apple.com |
| Docomo | Masato Taniguchi | [masato.taniguchi.mf@nttdocomo.com](mailto:masato.taniguchi.mf@nttdocomo.com) |
| NEC | Hisashi Futaki | hisashi.futaki @ nec.com |
| Sequans | Olivier Marco | omarco@sequans.com |
| CATT | Shijie | shijie@catt.cn |

# Discussion

## RMSI search space

* R2-2202106 Reply LS on RMSI reception based on non-zero search space (R1-2112765; contact:OPPO) RAN1 LS in Rel-15 To:RAN2
* R2-2202272 Clarification of search space configuration for RMSI-R15 OPPO CR Rel-15 38.331 15.16.0 2884 - F NR\_newRAT-Core
* R2-2202273 Clarification of search space configuration for RMSI-R16 OPPO CR Rel-16 38.331 16.7.0 2885 - A NR\_newRAT-Core

In [1]. RAN1 has sent the following reply to RAN2.

RAN1 thanks RAN2 for the discussions and questions on RMSI reception based on non-zero search space.

RAN1 has discussed the issue and it is RAN1’s understanding that for the cases when the dedicated BWP for a UE in RRC connected states does not include the cell-defining SSB and a non-zero search space set is configured for SIB1 reception, there is no need to define a mapping between PDCCH monitoring occasions and SSB(s). For monitoring this search space set, the QCL assumption is determined as descried in 10.1 of 38213.

Based on this reply, in [2]. , Oppo proposes to enhance the field description of searchSpaceSIB1 as follows (coloured text being the newly added text).

|  |
| --- |
| ***searchSpaceSIB1***  ID of the search space for *SIB1* message. In the initial DL BWP of the UE′s PCell, the network sets this field to 0. If the field is absent, the UE does not receive *SIB1* in this BWP. (see TS 38.213 [13], clause 10). If the field is set to non-zero, the UE monitor this searchspace for RMSI and the QCL assumption is determined as descried in TS 38.213 [13], clause 10.1. |

Based on this, the rapporteur would like to ask companies the following question.

Question-1: Do you think the changes as proposed in R2-2202272 (and in the mirror CR R2-2202273) is correct and also if it is a necessary correction?

|  |  |  |  |
| --- | --- | --- | --- |
| **Company name** | **Is the change correct?**  **YES/NO** | **Is the change necessary to be captured in RRC CR?**  **YES/NO** | **Comment** |
| ZTE | Yes | Prefer No | We think the change is not very necessary, as mentioned by RAN1, there is no need to define a mapping relation in this case and the UE follows the indicated TCI-states naturally.  But we won’t object if majority companies support it. |
| Ericsson (Tony) | Yes | No | Similar view of ZTE. We think that RAN1 specification is already clear about this and there is no need to overspecify things in RRC.  If majority of companies really want to have this change, since is not fixing any error or erroneus behaviour, we can think to have this change in the Rapporteur’s CR. |
| vivo | Yes |  | Agree with ZTE and Ericsson. |
| Nokia  (Amaanat) | Yes | No | LS from RAN1 is clear and we think implementations can use that as reference if required. |
| OPPO | Yes | Yes | It is not clear in the spec when the search space is set to non-zero for RMSI. So it results in more dicussion and LS to/from RAN1 in previous meetings. In order to make the spec clear, the RRC chagne is necessary. |
| Samsung | Yes | No, but | It’s not necessary, but it is still beneficial to update the corresponding field description, in order to avoid ambiguity. |
| MediaTek | Yes | No | Same view Ericsson |
| Apple | Yes |  | We feel the change is not very necessary, but can follow majority view. |
| Docomo | Yes | Maybe yes | It would help us not repeating the same discussion. |
| Huawei, HiSilicon | Yes | No | Similar feeling as most of others. |
| NEC | Yes | No, but | Agree with ZTE and Ericsson that we can also follow majority |
| Sequans | Yes | Prefer Yes | It would help understanding. Typo " descried" |
| CATT | Yes | No | Agree with ZTE and Ericsson |

**Rapporteur’s summary:**

In total 13 companies replied to this question and all (13/13) companies agree that the change is correct. However, (8/13) companies believe the CR is not necessary as the RAN1 specifications are already clear on this. Some companies have also indicated that the change proposed in the CR is not changing the UE behaviour (as RAN1 spec already had the clarification) and thus, if needed, then the changes can be merged with the rapporteur’s CR.

1. The CRs in R2-2202272 and R2-2202273 are not pursued.

## Measurement gaps related

* R2-2202393 Clarification on per UE/per FR gap setup and release inconsistency Nokia, Nokia Shanghai Bell discussion Rel-15

In this [4] contribution, Nokia wants to have clarification regarding the possible simultaneous configuration of per UE and per FR measurement gaps. The contribution discusses the following scenario and the corresponding behaviour.

1. UE is currently configured with per-UE measurement gap
2. The network sends a new configuration wherein the UE releases the per-UE measurement gap and sets up the per-FR measurement gap.

In the contribution, Nokia quotes the procedural text wherein the UE performs actions associated to ‘per-FR’ measurement gap related actions and then performs ‘per-UE’ measurement gap related actions. Thus, strictly following the procedural text, there will be a short time wherein the UE is configured with both per UE measurement gap and per-FR measurement gap which is forbidden as per the field description.

Based on this, the following proposals are made in the contribution.

**Proposal 1: RAN2 is requested to confirm that the per UE and per FR gap simultaneous configuration “temporarily” during the execution of the procedure 5.5.2.9 will not cause unspecified UE behavior.**

**Proposal 2: RAN2 to capture the common understanding in chair notes. The need for a CR maybe needs further discussion.**

Rapporteur would like to ask the following questions based on the above.

Question-2: Do you think the per UE and per FR gap simultaneous configuration “temporarily” during the execution of the procedure 5.5.2.9 will not cause unspecified UE behaviour?

|  |  |  |
| --- | --- | --- |
| **Company name** | **YES/NO** | **Comment** |
| ZTE | Yes with comments | We agree that iterally the spec seems to allow simultaneous configuration of per-UE and per-FR gap “temporarily”. But we think it can be handled by smart UE implementation and no problem should occur. |
| QCOM | Yes but | I’ve just want to make sure that we’re discussing here the  “transient **configuration**“, i.e. it’s **not expected from the UE to comply** to both configurations simultenously, instead be able to handle both configurations gracefully. |
| vivo | Yes | The procedure seems not to prevent simultaneous configuration of per-UE and per-FR gap “temporarily”. |
| Nokia | Yes, but | We also think this is transient case but we just want to have clear understanding that all companies do have the same view that there should not be a problem from UE side due to this specification. |
| Ericsson | Yes with comments | We agree that a UE cannot be configured with both per UE and per FR emasuerment gap configurations and the procedural text is just a “temporary“ stage within the UE implementation and we believe there is no need to clarufy anything here. |
| OPPO | Yes | It is true that per UE gap and per FR gap can not be configured simultaneously. But I think the temppory co-existing is OK. |
| Samsung | Yes | The current procedural flow may result in any ambiguity. We have assumed it’s benefical for RAN2 to shortly clarify it. |
| MediaTek | Yes |  |
| Apple | Yes | This is indeed a transient case and we think smart UE(s) are able tot handle it. |
| Docomo | Yes |  |
| Huawei, HiSilicon | Yes | We agree that smart UE implementation can handle this case properly. |
| NEC | Yes | Our understanding is also that this temproal situation can hannep but it can be handled by UE implementation. |
| Sequans | Yes but | Same view as Qualcomm |
| CATT | Yes | We agree also this is a transient case and can be handled by UE implementation. |

Question-3: Is there a need to capture something in the chairman’s notes or in the RRC specification to clarify that there is no issue in this scenario?

|  |  |  |
| --- | --- | --- |
| **Company name** | **YES/NO** | **Comment (if you answer YES, please indicate if you prefer chairman’s notes to capture the RAN2 understanding or if you prefer RRC specification to capture the RAN2 understanding)** |
| ZTE | No | We think it can be handled by smart UE implementation, at least no problem has been identified in the field. |
| QCOM | No | We will be opening the door for many transient configuration cases. |
| vivo | No | UE implementation would enough. |
| Nokia | - | As proponent we just want to have common understanding, capturing in Chair notes is enough but generally it should be also mentioned that in any other case the UE should be able to handle this without creating a situation for reconfiguration failure. |
| Ericsson | No | Agree with Qualcomm that these transient configuration aspects can be left for UE to handle. |
| OPPO | No |  |
| Samsung | Yes with chair note | For clarification, we can agree to capture something in chair note, but need not do in RRC specification |
| MediaTek | No | We do not see real IODT issue in the field. So, Chairman note is enough if needed. |
| Apple | No | No need tot capture it in either chairman’s note or RRC spec. |
| Docomo | Yes with chair note |  |
| Huawei, HiSilicon | No |  |
| NEC | No | No need for spec change, while open for capturing in the chairman notes |
| Sequans | Yes | Fine to capture something in chair notes. |
| CATT | No | No need to capture it in RRC spec, but we are fine to capture it in chairman notes to clarify it. |

**Rapporteur’s summary:**

In total 14 companies participated in the Question-2 and all agree that there can be such ‘temporary’ stages in the configuration wherein strictly following the procedural text, the UE can have per UE and per FR measurement gaps. However, all companies agree that this is a transient configuration.

10 companies have indicated that no specification text changes or clarification via chair notes is required for such topics. Three companies are fine with a chair notes based clarification. Based on this and based on comments from companies that such transient configuration clarifications are not necessary to be specified, rapporteur proposes not to pursue any specification text changes or chairman notes based clarification for the changes associated to R2-2202393.

1. Changes associated to R2-2202393 are not pursued.

## ServingCellMO related

* R2-2203498 Clarification on servingCellMO (R15) Huawei, HiSilicon CR Rel-15 38.331 15.16.0 2962 - F NR\_newRAT-Core
* R2-2203499 Clarification on servingCellMO (R16) Huawei, HiSilicon CR Rel-16 38.331 16.7.0 2963 - A NR\_newRAT-Core

In [5], Huawei proposes the following changes in the RRC specification.

1. Clarification that the servingCellMO is always configured for a serving cell if the UE is expected to measure the serving cell.
2. Editorial corrections related to CSI-RS-Resource-Mobility.

For the servingCellMO related change, the reasoning provided is as follows.

In RAN2 #116, a contribution was submitted (R2-2111265) based on the RAN5 LS on servingCellMO (R2-2109370), which contains a proposal to clarify in the field description of servingCellMO that "The field is always configured for a serving cell if the UE is expected to measure the serving cell." Since few comments were received during offline, the offline moderator recommended to submit a separate CR to the next meeting.

Since the following agreement was achieved in RAN2 #116, it would be good to make this clear in the spec:

* [002] RAN2 to reply RAN5 that, for event A3/A5 triggering reporting configured on SCC, it is mandatory to configure servingCellMO for SCell in order to enable UE considering SCell to be a neighbouring cell

Based on the above, rapporteur asks the following question.

Question-6: Do you agree with the changes related to the field description of servingCellMO as captured in R2-2203498 (+ the mirror CR in R2-2203499) and do you think that this change is necessary?

|  |  |  |  |
| --- | --- | --- | --- |
| **Company name** | **Agree with the change?**  **YES/NO** | **Is the change necessary?**  **YES/NO** | **Comment** |
| ZTE | No | No | We think the change is not necessary, based on the text procedure in clause 5.5.3.1, it is clear that the UE only performs serving cell measurements for which servingCellMO is configured. There is no need to repeat it in the field description.  The UE shall:  1> whenever the UE has a *measConfig*, perform RSRP and RSRQ measurements for each serving cell for which *servingCellMO* is configured as follows: |
| QCOM | No | No | Already clear in the spec |
| vivo |  | No | The specification is clear enough. No need for any change. |
| Nokia | No | No | Editorial can move to rapporteur CR, but the procedural text already explains this?  "for each serving cell configured with servingCellMO:"  In our view the CR is unnecessary as it does not add any value. |
| Ericsson | No | No | Same view as ZTE |
| OPPO | No | No | The condtion for ServingcellMO is clear when it is madatory and when it is optional.  ==  This field is mandatory present for the SpCell if the UE has a *measConfig*, and it is optionally present, Need M, for SCells. |
| Samsung | Yes | No | Based on the RAN2 agreement, we can accept this short update in the field description. On the other hand, it may be sufficient with the agreement captured in chair note. |
| MediaTek | Yes | No | We think that the intend is okay but the change is not necessary as it is already covered by procedure text. |
| Apple | No | No | Already clear in current spec. |
| Docomo | Yes | No |  |
| Huawei, HiSilicon | Yes | Yes | We can see more clarity with this CR. |
| NEC |  | No | We also think the current spec is already clear from RAN2 point of view. |
| Sequans | Yes | Yes | From 5.5.3.1, UE performs serving cell measurement when servingcellMO is configured. But for A3/A5, as neighbour detection/measurement on th MO are needed anyway, it's not so clear that servingCellMO is mandatory to measure a serving cell on that MO. |
| CATT | No | No | Same view as ZTE. |

**Rapporteur’s summary:**

In total 14 companies participated in this discussion and (12/14) companies do not think any change is necessary in the RRC CR for the clarifications related to servingCellMO.

1. ServingCellMO related changes in CR R2-2203498 and R2-2203499 are not pursued.

The change related to the CSI-RS-Resource-Mobility is of the editorial in nature. Rapporteur proposes to include this change in the CR if the same CR associated to Question-6 if that is agreed and if the CR associated to Question-6 is not agreed, then it can be merged with the rapporteur’s CR.

Question-7: Do you agree with the following rapporteur’s proposal:

* If Question-6 related changes are not agreed, include the changes associated to CSI-RS-Resource-Mobility in R2-2203498 with the RRC rapporteur’s CR
* If Question-6 related changes are agreed, then the changes associated to CSI-RS-Resource-Mobility in R2-2203498 are included in the associated CR of question-6

|  |  |  |
| --- | --- | --- |
| **Company name** | **Agree?**  **YES/NO** | **Comment** |
| ZTE | Yes | The changes associated to CSI-RS-Resource-Mobility are editorial that can be merged into the rapporteur’s CR. |
| QCOM | Yes | Raporteur CR |
| Nokia | Yes | Raporteur CR |
| Ericsson | Yes | Agree to merge in the rapporteur CR. |
| OPPO | Yes |  |
| Samsung | Yes | It’s editorial, and need to include it anywhere |
| MediaTek | Yes | Agree to be in rapporteur’s CR |
| Apple | Yes | Editiorial changes can be merged in the rapporteur CR |
| Docomo | Yes |  |
| Huawei, HiSilicon |  | Not sure if there is a rapporteur CR at this meeting.  If there is no rapporteur CR, it would be ok to agree the changes in this CR or even in a later meeting (with more editorials), and no need for the rapporteur to create another CR only for this change. |
| NEC | Yes | We assume Rapporteur CR as commented to Q6 |
| Sequans | Yes |  |
| CATT | Yes |  |

**Rapporteur’s summary:**

(12/13) companies prefer to capture the changes related to CSI-RS-Resource-Mobility in CR R2-2203498 and R2-2203499 are merged with the rapporteur’s CR.

1. Changes related to CSI-RS-Resource-Mobility in CR R2-2203498 and R2-2203499 are merged with the rapporteur’s CR.

## Beam measurements related

* R2-2203335 On rsType to be used for beam measurements Ericsson CR Rel-15 38.331 15.16.0 2947 - F NR\_newRAT-Core
* R2-2203336 On rsType to be used for beam measurements Ericsson CR Rel-16 38.331 16.7.0 2948 - A NR\_newRAT-Core

In [7], Ericsson brings up corrections to the procedural text of rsType based beam measurement reporting. The reasoning provided for the changes is as follows:

This creates some ambiguity in the following scenario:

1. UE is configured with both SSB based and CSI-RS based measurements in different reporting configurations. Thus, the UE is expected to perform measurements of each of the serving cell based on both SSB and configured CSI-RSs.
2. UE triggers a measurement report based on the CSI-RS based measurement. Then the rsType=CSI-RS and thus the UE includes the CSI-RS based RSRP, RSRQ and SINR measurements of each of the serving cell as per the procedural text (refer to the CR for colour coding).
3. The reporting configuration that triggered the measurement report also includes the *reportQuantityRS-Indexes* and *maxNrofRS-IndexesToReport* and thus the UE is suppose to include the beam measurements for each of the serving cells.
   1. The UE executes the green procedural text (refer to the CR for colour coding) from 5.5.5.1 and enters 5.5.5.2. It is to be noted that the beam measurement procedural text (refer to the CR for colour coding) that calls the section 5.5.5.1 does not mention anything about the rsType.

The UE enters the section 5.5.5.2 and the UE executes the yellow procedural text (refer to the CR for colour coding). **However, this text is not clear ‘if the measurement information to be included is based on SS/PBCH block’. It is not clear as to how does the UE know which rsType based beam measurements are to be reported?**

Based on the above, rapporteur would like to ask the following.

Question-8: Do you agree with the changes proposed in R2-2203335 (+ mirror CR in R2-2203336) and do you think that this change is necessary?

|  |  |  |  |
| --- | --- | --- | --- |
| **Company name** | **Agree with the change?**  **YES/NO** | **Is the change necessary?**  **YES/NO** | **Comment** |
| ZTE | Prefer No | Prefer No | We think there is no IoT issue in the field, so in our view, the changes are more like editorial, we are fine with the original wording (no CR), or to merge the changes into the rapporteur’s CR. |
| QCOM | - | - | rsType is a mandaotry IE and current text can implicitly relate to rsType ... will go with majority |
| vivo |  | No | We do not think the issue is critical. |
| Nokia | No | No | This change does not seem essential so we don’t think this is critical issue to handle in R15R16 |
| Ericsson | Yes | Yes | We believe the changes are necessary as indicated in the cover sheet. The procedural text in the beam reporting section is very vague currently and this could lead to wrong implementations when the CSI-RS based L3 measurements‘ configuration becomes common. |
| OPPO | No | No | No stronge view, but we can not see the critical issue. |
| Samsung | No | No | We have assumed the current procedural text is clear. Futhermore, the suggested change has functionally no remarkable difference from the legacy text. |
| MediaTek | Prefer No | No | We don’t really think the current text will result in wrong UE implemeantion. |
| Apple | No | No | rsType is a mandaotry IE and current text can be implicitly related to rsType |
| Docomo |  |  | Current text looks clear to us, but we are open to discussion on e.g. what is the potential issue caused by this „ambiguity“ if any |
| Huawei, HiSilicon | No | No | We don’t think the changes are essential either. |
| NEC |  | No strong view | Changes look correct, while we are fine with either agreeing with the CR or merging the changes to rapporteur CR (or do nothing), based on majority |
| CATT | No | No | We do not see the critical issue. |

**Rapporteur’s summary:**

13 companies participated in the email discussion and (12/13) companies agree that no change is needed.

1. Changes in R2-2203335 and R2-2203336 are not pursued.

# Conclusion

Based on the discussion in the previous sections we propose the following:

[**Proposal 1 The CRs in R2-2202272 and R2-2202273 are not pursued.**](#_Toc96579164)

[**Proposal 2 Changes associated to R2-2202393 are not pursued.**](#_Toc96579165)

[**Proposal 3 ServingCellMO related changes in CR R2-2203498 and R2-2203499 are not pursued.**](#_Toc96579166)

[**Proposal 4 Changes related to CSI-RS-Resource-Mobility in CR R2-2203498 and R2-2203499 are merged with the rapporteur’s CR.**](#_Toc96579167)

[**Proposal 5 Changes in R2-2203335 and R2-2203336 are not pursued.**](#_Toc96579168)

# References

1. R2-2202106 Reply LS on RMSI reception based on non-zero search space (R1-2112765; contact:OPPO) RAN1 LS in Rel-15 To:RAN2
2. R2-2202272 Clarification of search space configuration for RMSI-R15 OPPO CR Rel-15 38.331 15.16.0 2884 - F NR\_newRAT-Core
3. R2-2202273 Clarification of search space configuration for RMSI-R16 OPPO CR Rel-16 38.331 16.7.0 2885 - A NR\_newRAT-Core
4. R2-2202393 Clarification on per UE/per FR gap setup and release inconsistency Nokia, Nokia Shanghai Bell discussion Rel-15
5. R2-2203498 Clarification on servingCellMO (R15) Huawei, HiSilicon CR Rel-15 38.331 15.16.0 2962 - F NR\_newRAT-Core
6. R2-2203499 Clarification on servingCellMO (R16) Huawei, HiSilicon CR Rel-16 38.331 16.7.0 2963 - A NR\_newRAT-Core
7. R2-2203335 On rsType to be used for beam measurements Ericsson CR Rel-15 38.331 15.16.0 2947 - F NR\_newRAT-Core
8. R2-2203336 On rsType to be used for beam measurements Ericsson CR Rel-16 38.331 16.7.0 2948 - A NR\_newRAT-Core.