**3GPP TSG-RAN WG2 Meeting #118-e R2-220**

**Electronic, 09 – 20 May 2022**

**Agenda item: 5.1.4.4**

**Source: Qualcomm Incorporated**

**Title: [AT118-e][ 022][NR1516] Idle/Inactive mode (Qualcomm)**

**Document for: Discussion and decision**

# Introduction

This document will report the discussion and outcome of Rel-15 and Rel-16 corrections for Idle and Inactive mode per the following email discussion:

* [AT118-e][022][NR1516] Idle/Inactive mode (Qualcomm)

      Scope: Treat [R2-2205946](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_118-e%5CDocs%5CR2-2205946.zip), [R2-2205945](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_118-e%5CDocs%5CR2-2205945.zip), R2-2204482, R2-2204826, R2-2205476, R2-2205742, R2-2205743

      Ph1 Determine agreeable parts, Ph2 for agreeable parts agree CRs (offline agreement, CB online only if necessary).

      Intended outcome: Report, Agreed CRs

      Deadline: Schedule 1

The Chair Notes has the following regarding Schedule 1:

Discussions with Deadline **Schedule 1**:

A **first round** with **Deadline for comments W1 Thursd May 12th 1200 UTC** to settle scope what is agreeable etc

A Final round with **Final deadline W2 Wednesd May 18th 1200 UTC** to settle details / agree CRs etc.

Additional deadlines check points etc if needed are defined by the Rapporteur of each discussion respectively. In case some parts of an email discussion need more time, doesn’t converge, need on-line treatment, then please contact the chair.

Please provide your contact information in the table below.

|  |  |
| --- | --- |
| **Company** | **Contact Name, Email** |
| Qualcomm | Ozcan Ozturk, oozturk@qti.qualcomm.com |
| Lenovo | Hyung-Nam Choi, hchoi5@lenovo.com |
| Nokia | amaanat.ali@nokia.com |
| OPPO | Yi Hu, hu.yi@oppo.com |
| Ericsson | Tuomas Tirronen, tuomas.tirronen@ericsson.com |
| MediaTek | Felix Tsai, chun-fan.tsai@mediatek.com |
| Huawei, HiSilicon | zhaoyang@huawei.com |
| Vivo | Chenli5g@vivo.com |
| CATT | Pierre Bertrand, pierrebertrand@catt.cn |
| Samsung | Sangyeob Jung, sy0123.jung@samsung.com |
| Intel | Sudeep Palat, sudeep.k.palat@intel.coom |

# Discussion

The following papers were submitted to RAN2#118-e for Rel-15 and Rel-16 corrections for Idle/Inactive mode:

[R2-2205946](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_118-e%5CDocs%5CR2-2205946.zip)   Miscellaneous Editorial Corrections           Qualcomm Incorporated CR       Rel-16           38.304  16.7.0   0250     -           D          TEI16

[R2-2205945](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_118-e%5CDocs%5CR2-2205945.zip)   Miscellaneous Editorial Corrections           Qualcomm Incorporated CR       Rel-17           38.304  17.0.0   0249     -           D          TEI17

Moved from AI6.0.3

[R2-2204482](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_118-e%5CDocs%5CR2-2204482.zip)   Reply LS to RAN2 on RRM relaxation in power saving (R4-2207038; contact: CATT)     RAN4   LS in    Rel-16  NR\_UE\_pow\_sav-Core To:RAN2

[R2-2204826](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_118-e%5CDocs%5CR2-2204826.zip)   Correction on RRM relaxation in PowSav  vivo      CR       Rel-16  38.304   16.7.0   0239     -           F          NR\_UE\_pow\_sav-Core

[R2-2205476](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_118-e%5CDocs%5CR2-2205476.zip)   Correction on RRM relaxation in PowSav  vivo      CR       Rel-17  38.304   17.0.0   0244     -           A          NR\_UE\_pow\_sav-Core

[R2-2205742](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_118-e%5CDocs%5CR2-2205742.zip)   Addressing inconsistency for RRM measurement rules      Ericsson, CATT CR   Rel-16  38.304  16.7.0   0247     -           F          NR\_UE\_pow\_sav-Core

[R2-2205743](file:///C%3A%5CUsers%5Cmtk65284%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2_RL2%5CTSGR2_118-e%5CDocs%5CR2-2205743.zip)   Addressing inconsistency for RRM measurement rules      Ericsson, CATT CR   Rel-17  38.304  17.0.0   0248     -           A          NR\_UE\_pow\_sav-Core

Moved from 6.9

R2-2205946 and R2-2205945 are editorial corrections with CR category of Cat D. There doesn’t seem to be anything controversial with the changes.

**Question 1: Can R2-2205946 and R2-2205945 be agreed? If not, please justify your response**

|  |  |  |
| --- | --- | --- |
| **Company** | **Response** | **Comments** |
| Lenovo | To be revised | Rel-16 CR in R2-2205946:* Cover page: Impact analysis missing.
* On renumbering of the notes we prefer to keep the numbering of the legacy Rel-15 Notes (i.e. number the unnumbered note to 1 and keep numbers 2, 3) and renumber the new Rel-16 notes as 4 to 8. Otherwise, the numbers of the Rel-15 Notes are not aligned with Rel-17 CR in R2-2205945 where the legacy Rel-15 Notes are numbered as 8 to 10.
* Furthermore, same as in the Rel-17 CR in R2-2205945 the SIB naming issues in subclause 8.1 can be fixed as well, i.e. replace SystemInformationBlockType12, SystemInformationBlockType13 and SystemInformationBlockType14 by SIB12, SIB13 and SIB14.

Rel-17 CR in R2-2205945:* Cover page: Impact analysis missing.
* On renumbering of the notes same comment as for the Rel-16 CR. And the new Rel-17 Notes should be numbered as 9, 10.
* Other changes are ok.
 |
| Nokia | To be revised | Agree with Lenovo’s comments, otherwise the CRs are okay |
| OPPO | To be revised | Agree with Lenovo’s comments |
| Ericsson | To be revised | Agree with Lenovo’s comments |
| MediaTek | To be revised | Agree with Lenovo’s comments |
| Huawei, HiSilicon | To be revised | Agree with Lenovo’s comments |
| vivo | To be revised | Agree with Lenovo’s comments |
| CATT | To be revised | Agree with Lenovo’s comments |
| Samsung | To be revised | Agree with Lenovo’s comments |
| Intel |  | Agree with Lenovo comments |

**Summary:**

**Proposal:**

The topic of Rel-16 RRM relaxation and alignment with RAN4 specifications were discussed in RAN2#115-e and an LS was sent to RAN4 in R2-2108877, requesting feedback on the discrepancy between low-mobility only case and both low-mobility and not-at-cell-edge case.

RAN4 has responsed to RAN2 in R2-2204482 which states that RAN4 has made the following changes to TS 38.133:

* When Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ, the UE shall search for inter-frequency /E-UTRA inter-RAT frequency layers of higher priority at least every 1 hour
* When Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ, the UE shall search for inter-frequency /E-UTRA inter-RAT frequency layers of higher priority at least every “Nlayers \* 1 hour”

There are two sets of 38.304 CRs on this topic: one from Vivo in R2-2204826 (Rel-16) and R2-2204827 (Rel-17 shadow) and one from Ericsson/CATT in R2-2205742 (Rel-16) and R2-2205743 (Rel-17 shadow).

The CRs are very similar. The second change for “if both *lowMobilityEvaluation* and *cellEdgeEvaluation* are configured” is same in both CRs. The first change for “if *lowMobilityEvaluation* is configured and *cellEdgeEvaluation* is not configured” is slightly different but they are functionally same and both refer to TS 38.133. Ericsson CR puts the reference in one sentence while Vivo CR has a separate sentence when “if *highPriorityMeasRelax* is configured”.

Both sets of CRs seem to be correct and the minor difference is a matter of editorial preference. The rapporteur thinks we can agree to one set of CRs.

**Question 2: Which sets of CRs do you support: R2-2204826/R2205476 or R2-2205742/R2-2205743? If neither, please justify your response.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Response** | **Comments** |
| Nokia | Okay with the changes | No specific preference the observations are valid in both the set of CRs. |
| OPPO | R2-2205742/R2-2205743 with commments | We think the CRs from Ericsson/CATT is more simple.For the following, it seems the case of intra-frequency cells is missing.

|  |
| --- |
| - if both *lowMobilityEvaluation* and *cellEdgeEvaluation* are configured:- if the UE has performed normal intra-frequency, NR inter-frequency, or inter-RAT frequency measurements for at least TSearchDeltaP after (re-)selecting a new cell; and- if the relaxed measurement criterion in clause 5.2.4.9.1 is fulfilled for a period of TSearchDeltaP; and- if the relaxed measurement criterion in clause 5.2.4.9.2 is fulfilled:- the UE may choose to perform relaxed measurements for intra-frequency cells, NR inter-frequency cells or inter-RAT frequency cells according to relaxation methods in clauses 4.2.2.9, 4.2.2.10, and 4.2.2.11 in TS 38.133 [8]; |

 |
| Ericsson | R2-2205742 (Rel-16) and R2-2205743 (Rel-17 shadow) (proponent) | We ended up with some duplication in 38.304 and 38.133 and from that perspective, we think it is better to just refer to 38.133 and avoid the duplication. Thanks to OPPO for spotting the error, i.e. the intra-frequency case was missing:the UE may choose to perform relaxed measurements for intra-frequency cells, NR inter-frequency cells or inter-RAT frequency cells according to relaxation methods in clauses 4.2.2.9, 4.2.2.10, and 4.2.2.11 in TS 38.133 [8];PS: the cover page also mentions 38.331 and thus wrong CRnum, i.e. a revision is needed anyways. Sorry, not the best submission.  |
| MediaTek | R2-2205742/R2-2205743 | Both CR set seems okay. We slightly prefer Ericsson/CATT one which is simpler. The comment from OPPO and the coversheet issue could be taken into account while revising the CR. |
| Huawei, HiSilicon |  | Both sets of CRs are fine, maybe 5742/5743 is a bit simpler, anyway we can go with the majority. |
| vivo | R2-2204826 (Rel-16) and R2-2204827 (Rel-17 shadow)(proponent) | Both sets of CRs work. 2nd change in two sets of CRs are the same.For the 1st change, the only difference between two sets of CRs are the usage of parameter “*highPriorityMeasRelax*”. Our understanding is this parameter was introduced in RAN2 and it impacts on the configuration of RRM relaxation criteria. Thus, it is better to capture this parameter in RAN2 specification. Set of CRs R2-2204826/R2-2204827 has better reflection on this parameter.  |
| CATT | R2-2205742/R2-2205743 (proponent) | … with the addition from OPPO (thanks for spotting)!Same as above comments, we think this version minimizes the redundancy between RAN2 and RAN4 specs.  |
| Samsung | R2-2204826/R2-2205476 | For Ericsson/CATT CR, we think that it may be misleading to say "perform relaxed measurement for higher priority frequencies" if the low mobility criterion is met, Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ, and *highPriorityMeasRelax* is not configured in the sence that the UE does not perform relaxed measurement but performs legacy measurement i.e. at least every Thigher\_priority\_search. Additionally the field *highPriorityMeasRelax* is signalled in SIB2 so it would be good to clarify the UE behavior accordingly in TS 38.304 i.e. how to perform measurements based on presence/absence of *highPrioirtyMeasRelax.* Having said that, we prefer Vivo CR package rather than just referring to TS 38.133 as in Ericsson/CATT one. If we go for R2-2204826/R2-2205476, it seems that further updates are needed as highlighted below: 5.2.4.9 Relaxed measurement5.2.4.9.0 Relaxed measurement rulesWhen the UE is required to perform measurements of intra-frequency cells or NR inter-frequency cells or inter-RAT frequency cells according to the measurement rules in clause 5.2.4.2:- if *lowMobilityEvaluation* is configured and *cellEdgeEvaluation* is not configured; and…- if the serving cell fulfils Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ:- if *highPriorityMeasRelax* is configured with value *true*:- the UE may choose to perform relaxed measurements for NR inter-frequency cells or inter-RAT frequency cells on frequencies of higher priority according to relaxation methods in clause 4.2.2.10 and 4.2.2.11 in TS 38.133 [8];…- if both *lowMobilityEvaluation* and *cellEdgeEvaluation* are configured:- if the UE has performed normal intra-frequency, NR inter-frequency, or inter-RAT frequency measurements for at least TSearchDeltaP after (re-)selecting a new cell; and- if the relaxed measurement criterion in clause 5.2.4.9.1 is fulfilled for a period of TSearchDeltaP; and- if the relaxed measurement criterion in clause 5.2.4.9.2 is fulfilled:- the UE may choose to perform relaxed measurements for intra-frequency cells, NR inter-frequency cells or inter-RAT frequency cells according to relaxation methods in clauses 4.2.2.9, 4.2.2.10, and 4.2.2.11 in TS 38.133 [8];- else:…- if *combineRelaxedMeasCondition* is not configured:- the UE may choose to perform relaxed measurements for intra-frequency cells, NR inter-frequency cells of equal or lower priority, or inter-RAT frequency cells of lower priority according to relaxation methods in clauses 4.2.2.9, 4.2.2.10, and 4.2.2.11 in TS 38.133 [8];- if the serving cell fulfils Srxlev ≤ SnonIntraSearchP or Squal ≤ SnonIntraSearchQ:- the UE may choose to perform relaxed measurement for NR inter-frequency cells of higher priority, or inter-RAT frequency cells of higher priority according to relaxation methods in clauses 4.2.2.10, and 4.2.2.11 in TS 38.133 [8];- else (i.e. the serving cell fulfils Srxlev > SnonIntraSearchP and Squal > SnonIntraSearchQ):- if the UE has performed normal NR inter-frequency, or inter-RAT frequency measurements for at least TSearchDeltaP after (re-)selecting a new cell, and the relaxed measurement criterion in clause 5.2.4.9.1 is fulfilled for a period of TSearchDeltaP:- if *highPriorityMeasRelax* is configured with value *true*:- the UE may choose to perform relaxed measurements for NR inter-frequency cells or inter-RAT frequency cells on frequencies of higher priority according to relaxation methods in clause 4.2.2.10 and 4.2.2.11 in TS 38.133 [8]; |
| Intel | See comments | We would be OK to refer to RAN4 specs as in the Ericsson/CATT CR but we noticed a few issues that would need to be corrected:1. In 38.331, highPriorityMeasRelax refers to 38.304 section 5.2.4.9.0, while there will be no action specified in 38.304
2. 38.304 itself mentions highPriorityMeasRelax in the list of parameters and refers to section 5.2.4.9.0.
 |

**Summary:**

**Proposal:**

# Conclusion

Based on the discussion and the feedback from companies above, the following are proposed for the corrections of Rel-15 and Rel-16 Idle/Inactive Mode: