**3GPP TSG-RAN WG2 Meeting #115e R2-21xx**

**Electronic, 9 – 27 August 2021**

**Agenda item: 6.1.4.4**

**Source: Qualcomm Incorporated**

**Title: [AT115-e][030][NR15NR16] Idle Inactive (Qualcomm)**

**Document for: Discussion and decision**

# Introduction

RAN2 Chair decided to use the following offline to treat the Rel-16 corrections for Idle and Inactive procedures.

* [AT115-e][030][NR15NR16] Idle Inactive (Qualcomm)

 Scope: Determine agreeable parts and agree CRs, Await on-line for R2-2106959, R2-2107088, R2-2107402, R2-2107403, R2-2108841, Treat R2-2108364, R2-2108365, R2-2108481, R2-2107263, R2-2108362

 Intended outcome: Report, Agreed CRs.

 Deadline: Schedule 1

The list of the contributions submitted to the Agenda Item “5.4.4 Idle/inactive mode procedures” for Rel-15 corrections is as follows:

[R2-2108364](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108364.zip) Clarification of barring when TAC is missing in RAN sharing Qualcomm Incorporated CR Rel-15 38.304 15.7.0 0216 - F NR\_newRAT-Core

[R2-2108365](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108365.zip) Clarification of barring when TAC is missing in RAN sharing Qualcomm Incorporated CR Rel-16 38.304 16.5.0 0217 - A NR\_newRAT-Core

[R2-2108481](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108481.zip) Cell barring due to SIB1 acquisition failure Lenovo, Motorola Mobility discussion Rel-15 NR\_newRAT-Core

[R2-2107263](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2107263.zip) Corrections to intra-frequency cell reselection for MIB, SIB1 acquisition failure and TAC absence in SIB1 Lenovo, Motorola Mobility CR Rel-16 38.331 16.5.0 2716 - F NR\_unlic-Core, NG\_RAN\_PRN-Core

Moved from 6.1.4.1.3, Wrong Wi-codes

The list of the contributions submitted to the Agenda Item “6.1.4.4 Idle/inactive mode procedures” and the initial online discussion and outcome are as follows:

RRM Relaxation

On-line

[R2-2106959](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_115-e%5CDocs%5CR2-2106959.zip) LS on RRM relaxation in power saving (R4-2108230; contact: CATT, Ericsson) RAN4 LS in Rel-16 NR\_UE\_pow\_sav-Core To:RAN2

* Noted

[R2-2107402](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_115-e%5CDocs%5CR2-2107402.zip) Discussion on LS from RAN4 on RRM relaxation in power saving vivo, Huawei, HiSilicon, Qualcomm discussion Rel-16 NR\_UE\_pow\_sav-Core

* Noted

[R2-2108236](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108236.zip) Addressing inconsistency for RRM measurement rules Ericsson CR Rel-16 38.304 16.5.0 0214 - F NR\_UE\_pow\_sav-Core

=> Revised in R2-2108841

[R2-2108841](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_115-e%5CDocs%5CR2-2108841.zip) Addressing inconsistency for RRM measurement rules Ericsson, CATT CR Rel-16 38.304 16.5.0 0214 1 F NR\_UE\_pow\_sav-Core

* Noted

[R2-2107088](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_115-e%5CDocs%5CR2-2107088.zip) Correction on RRM relaxation of higher priority frequencies OPPO CR Rel-16 38.304 16.5.0 0212 - F NR\_UE\_pow\_sav-Core

* Noted

DISCUSSION

- MTK agree with vivo and think 1h is long enough. Samsung also support vivo. Huawei think that this just follows how it was done for NB-IoT (24h). ZTE support vivo technically but tend to agree that this is R4 domain. LG support vivo view, think we need to understand reason for R4 LS.

- CATT think this is in R4 domain it is not R2 domain to decide whether 1h is enough.

- Oppo think R4 has discussed this for two meetings, and think R2 need to follow R4.

- Apple support Ericsson/CATT,

- Xiaomi think R2 may need to change.

- Nokia think the LS is straightforward.

- Chair proposes that R2 follow the request from R4.

- vivo cannot accept this. Ericsson think that vivo should discuss 1h or not this should be changed in R4.

* R2 to follow the request from R4
* Progress the CRs offline, and reply LS if agreeable.

[R2-2107403](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2107403.zip) [Draft] Reply LS to RAN4 on RRM relaxation in power saving vivo LS out Rel-16 NR\_UE\_pow\_sav-Core To:RAN4

Reselection

[R2-2108362](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_115-e%5CDocs%5CR2-2108362.zip) Clarification of access restrictions during cell re-selection Qualcomm Incorporated CR Rel-16 38.304 16.5.0 0215 - F NR\_newRAT-Core, NG\_RAN\_PRN-Core

This document will capture feedback from companies on above contributions and Rel-16 CR for RRM relaxation in order to determine agreeable CRs or parts.

|  |  |
| --- | --- |
| Company | Contact Name, Email |
| Nokia | Jarkko Koskela (jarkko.t.koskela@nokia.com) |
| Ericsson | Mattias Bergström (mattias.a.bergstrom@ericsson.com) |

# Rel-15 Corrections

[R2-2108364](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108364.zip) Clarification of barring when TAC is missing in RAN sharing Qualcomm Incorporated CR Rel-15 38.304 15.7.0 0216 - F NR\_newRAT-Core

[R2-2108365](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108365.zip) Clarification of barring when TAC is missing in RAN sharing Qualcomm Incorporated CR Rel-16 38.304 16.5.0 0217 - A NR\_newRAT-Core

Reason for change:

When the condition for missing TAC applies, the UE “shall exclude the barred cell as a candidate for cell selection/reselection for 300 seconds” as captured in Section 5.3.1.However, if the UE bars the cell for the above reason and later selects another PLMN which broacasts a TAC, the UE should not wait until the end of 300 seconds since the barring condition is no longer applicable.

Summary of changes:

Add a Note that the UE may (re)-select a cell when the cell was barred due to missing TAC but afterwards the UE selects a PLMN which does broadcast a TAC.

Rapporteur comment:

We are the proponent. This problem was observed in the field where RAN sharing for NR is employed. Since AS does not provide TAC related information to NAS, PLMN selection may result in a PLMN without TAC and the corresponding barring. It should be noted that AS has no control over NAS in selecting a PLMN other than providing the list of PLMNs from SIB1. Another possible solution could be to specify where AS reports the associated TACs to NAS and NAS considers this in PLMN selection. However, this will bring too much impact to the AS and NAS specifications. Therefore, we are proposing to leave this to the UE implementation by a Note.

**Q1: Do you agree with the changes in the CR? If not, please provide comments/justification.**

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| --- | --- | --- |
| **Company** | **Response** | **Comments** |
| Nokia | No | Barring is not lasting always 300 seconds but it is up to UE implementation how long it lasts and at maximum 300 seconds. |
| Ericsson | Agree, with comments.. | We think it is already allowed to do what the CR suggests:For RAN sharing, a **physical** cell can have multiple **logical** cells. The UE may end up barring one of those logical cells if the TAC is missing. But that does not forbid the UE from selecting the other logical cell to see if a TAC is provided.But we understand that the spec is not crystal clear on this and some change like QC suggestsion would be good, but perhaps some clarification would be good:NOTE 2: If barring of a cell is triggered by the condition of trackingAreaCode not being provided, as specified in [3], the UE can re-evaluate the barring condition again due to selection of another PLMN. |

**Summary:**

**Proposal:**

[R2-2108481](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108481.zip) Cell barring due to SIB1 acquisition failure Lenovo, Motorola Mobility discussion Rel-15 NR\_newRAT-Core

Proposal:

RAN2 is asked to allow the UE to lift the fixed cell barring time of 300 seconds and ignore the setting of field *intraFreqReselection* in MIB in case of SIB1 acquisition failure.

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Summary of changes:

The text in red is added:

- If the cell is to be treated as if the cell status is "barred" due to being unable to acquire the *MIB or the SIB1*:

- the UE may exclude the barred cell as a candidate for cell selection/reselection for up to 300 seconds.

- the UE may select another cell on the same frequency if the selection criteria are fulfilled.

Rapporteur comment:

As discussed in the paper, there is a history of the changes for barring due to missing SIB1. The text in red above was removed so that the UE does not ignore MIB IFRI. It was also agreed that the “UE shall” bar when SIB1 is missing. However, it is logical that the UE should not be forced to bar a cell for 300 seconds when SIB1 is missing. In general, “shall” should apply when there is an explicit barring from the network e.g. via IEs in SIB1 and “may” should apply when it is due to unexpected events, e.g. missing MIB or SIB1, so that the UE can try again to remedy the unexpected event. This principle was followed in LTE and in NR Rel-15 until recently.

**Q2: Do you agree with the proposal and the change? If not, please provide comments/justification.**

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| --- | --- | --- |
| **Company** | **Response** | **Comments** |
| Nokia | No | UE is allowed already since UTRA times to lift barring earlier than 300 seconds has elapsed. Spec says “up to 300 seconds” not “for 300 seconds”. |
| Ericsson | Yes | We are OK to align NR behaviour with LTE behaviour. |

**Summary:**

**Proposal:**

[R2-2107263](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2107263.zip) Corrections to intra-frequency cell reselection for MIB, SIB1 acquisition failure and TAC absence in SIB1 Lenovo, Motorola Mobility CR Rel-16 38.331 16.5.0 2716 - F NR\_unlic-Core, NG\_RAN\_PRN-Core

Reason for change:

For MIB, SIB1 acquisition failure and TAC absence in SIB1 the UE actions with regards to intra-frequency reselection in accordance with the setting of field *intraFreqReselection* in MIB are specified in both TS 38.331 and TS 38.304. However, such duplication is not needed and should be avoided.

Furthermore, for SIB1 acquisition failure and TAC absence in SIB1 the UE actions with regards to intra-frequency reselection when field *intraFreqReselection* is set to *notAllowed* is not aligned with the latest version of TS 38.304. This may cause some confusion which specification takes precedence.

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Summary of changes:

In 5.2.2.4.1, 5.2.2.4.2, 5.2.2.5 the UE actions with regards to intra-frequency reselection in accordance with the setting of field *intraFreqReselection* in MIB have been replaced by the action below:

*perform cell re-selection to other cells on the same frequency as the barred cell as specified in TS 38.304 [20].*

Rapporteur comment:

Agree that the duplicate descriptions in 38.331 for barring are unnecessary and can lead to confusion. It will be cleaner and easier for future changes if such behavior is only described in 38.304. Note that the change here for “missing SIB1” will also depend on the outcome of the above discussion for [R2-2108481](file:///D%3A/Documents/3GPP/tsg_ran/WG2/RAN2/2108_R2_115-e/Docs/R2-2108481.zip).

**Q3: Do you agree with the changes in the CR? If not, please provide comments/justification.**

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| **Company** | **Response** | **Comments** |
| Nokia | Fine to have | We have proposed to remove duplication earlier but it was not agreed. We are fine to remove it now. |
| Ericsson | Yes |  |

**Summary:**

**Proposal:**

1. Rel-16 Corrections

**RRM Relaxation:**

During the first RAN2#115e online session, it was agreed that **“R2 to follow the request from R4”.** There were two CRs which were based on following RAN4 request:

[R2-2108841](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_115-e%5CDocs%5CR2-2108841.zip) Addressing inconsistency for RRM measurement rules Ericsson, CATT CR Rel-16 38.304 16.5.0 0214 1 F NR\_UE\_pow\_sav-Core

[R2-2107088](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_115-e%5CDocs%5CR2-2107088.zip) Correction on RRM relaxation of higher priority frequencies OPPO CR Rel-16 38.304 16.5.0 0212 - F NR\_UE\_pow\_sav-Core

It was also captured in the Chair Notes to “progress the CRs offline, and reply LS if agreeable”. It would be natural to use one of these CRs as baseline and improve if needed. The main difference between these two CRs seems to be that R2-2108841 allows relaxed measurements for higher priority frequencies even when *highPriorityMeasRelax* is not *true* and Srxlev and Squal are not above a threshold.

**Q4: Which CR, R2-2108841 or R2-2107088, should be used as baseline? Neither is also an acceptable response.**

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| --- | --- | --- |
| **Company** | **Response** | **Comments** |
| Nokia | [R2-2107088](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_115-e%5CDocs%5CR2-2107088.zip) | CR seems to be according to LS from RAN4 |
| Ericsson | [R2-2108841](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_115-e%5CDocs%5CR2-2108841.zip) | The difference between the CRs is that the OPPO CR has the if-statement on if Srxlev is larger than the threshold. But that info is already present in the RAN4 specs and hence superfluous. We should not duplicate spec text. |

**Summary:**

**Proposal:**

Assuming one of the CRs above is used as a baseline, we can check if any further updates are needed or the CR can be agreed as is.

**Q5a: If R2-2108841 is used as a baseline, are there any changes needed to agree to the CR?**

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| **Company** | **Response** | **Comments** |
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**Summary:**

**Proposal:**

**Q5b: If R2-2107088 is used as a baseline, are there any changes needed to agree to the CR?**

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| --- | --- | --- |
| **Company** | **Response** | **Comments** |
| Nokia | No | We are ok with the CR |

**Summary:**

**Proposal:**

[R2-2108362](file:///D%3A%5CDocuments%5C3GPP%5Ctsg_ran%5CWG2%5CTSGR2_115-e%5CDocs%5CR2-2108362.zip) Clarification of access restrictions during cell re-selection Qualcomm Incorporated CR Rel-16 38.304 16.5.0 0215 - F NR\_newRAT-Core, NG\_RAN\_PRN-Core

Reason for change:

The CR refers to the list of previous Rel-16 NPN CRs which made unitended changes to the legacy non-NPN UE behavior. The CR attempst to correct this and make Rel-16 behavior consistent with Rel-15.

Summary of changes:

* Remove the duplicate sentence for “If the UE enters into state *any cell selection”.*
* Re-add the legacy text for “If the UE is redirected under NR control to a frequency for which the timer is running” for intra/inter-frequency case
* Clarify that the UE shall remove the limitation which triggered the timer for the limitation when “any cell selection” or “redirection” happens. The common text applies for the intra/inter-frequency as well as inter-RAT cases.

Rapporteur comment:

We are the proponent. The current Rel-16 specification is not clear on how the UE should bar cells during cell re-selection, including inter-RAT. It would be desirable to have a consistent UE behavior which is same as Rel-15 NR (and also LTE from where this was copied).

**Q6: Do you agree with the changes in the CR? If not, please provide comments/justification.**

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| **Company** | **Response** | **Comments** |
| Nokia | Yes | CR seems to be correcting unfortunate error. |
| Ericsson | Yes |  |

**Summary:**

**Proposal:**

# Conclusion

This report captures the feedback from companies for the contributions submitted to Rel-15 and Rel-16 corrections for Idle/Inactive mode procedures and proposes the following as way-forward: