**3GPP TSG-RAN WG2 Meeting #111e R2-20xxx**

**17 – 28 August 2020**

**Agenda item: 5.4.4**

**Source: Qualcomm Incorporated**

**Title: Report of [AT111-e][012][NR15] Idle mode**

**Document for: Discussion and decision**

# Introduction

This contribution will report the outcome of the following discussion on the CRs submitted for Idle/Inactive Mode operation for both Rel-15 and Rel-16:

* [AT111-e][012][NR15] Idle mode (QC)

 Scope: Treat R[2-2007064](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007064.zip), R2-2007097, R[2-2007119](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007119.zip), R[2-2007120](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007120.zip), R2-2008040, R[2-2008041](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2008041.zip), R2-2007963 (proponents to drive), Treat R2-2007963 (AI 6.1.3), include other corrections to be merged with rapporteur CR (if any)

 Part 1: Decision whether to make corrections, identify agreeable parts. Identify Controversial issues for on-line treatment (if any).

 Deadline: Aug 20, 0900 UTC.

 Part 2: For agreeable parts, continuation to agree CRs.

 Deadline: Aug 26, 0900 UTC.

# Discussion

## 2.1 Rapporteur CR for 36.304 (R[2-2007064](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007064.zip))

The 36.304 rapporteur Nokia has submitted the CR#085 for 36.304 which corrects several issues as follows:

1. Added NRS abbreviation
2. Changed timer for *altFreqPrioririties* from Txxx to T323
3. Changed various message names to *italics* font
4. “conditions are meet” changed to “conditions are met”
5. Changed condition to monitor GWUS not to be optional UE behaviour (i.e. removed parentheses)

The first four changes are editorial.

For the fifth change, there may be an overlap with the CRs which have more changes on GWUS in Agenda Item 7.3.2. For example, both R[2-2007336](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007336.zip) and R[2-2007567](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007567.zip) in AI 7.3.2. have changes on the text which is modified by R2-2007064. It is at least worth harmonizing this change with the outcome of the offline discussion “[AT111-e][305][NBIOT/eMTC R16] WUS related 36.304 corrections” in order to prevent conflicting changes.

**Do you agree to the changes proposed in R2-2007064? If not, please provide justification and/or alternative options.**

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| --- | --- | --- |
| **Company** | **Response** | **Comments** |
| **CATT（Jayson）** | **Yes but** | **We’re fine with the first four changes, as for the last one, it’s better to be discussed together with offline [AT111-e][305].** |
| **Nokia** | **Proponent** | **Fine to also discuss 5) in 305 discussion** |
| **Apple** | **With modification** | **WI code should be corrected.** |
| **vivo** | **Yes** | **Fine with these editorial changes and for the fifth to align with [AT111-e][305].** |
| **Huawei** | **Yes but** | **There are some corrections to GWUS proposed which will be included in GWUS corrections CR in NB-IoT session, so should be removed from this general CR.** |
| **LG** | **Yes** | **We are also fine with first four change and the fifth change can be discussed in 305 offline discussion.** |
| **Lenovo** | **Yes** | Cover page: WI code “TEI16” should be added due to correction on T323. |
| **MediaTek** | **Yes** |  |

**Summary:**

**Proposal:**

## 2.2 Rapporteur CR for 38.304 (R[2-2007963](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007963.zip))

This is a Category D CR for 38.304 which has the following editorial corrections:

1. The reference to TS 22.011 is added for “list of forbiddgen TAs”.
2. Change the typeface of “additionalPmax and “NR-NS-PmaxList” to italics in 5.2.3.2.
3. Correct ubscript for Qrxlevmin is not correct in two places in 5.2.3.2.
4. Replace “relaxed monitoring” with “relaxed measurement” in 5.2.4.9.1.

**Do you agree to the changes proposed in R**[**2-2007963**](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007963.zip)**? If not, please provide justification and/or alternative options.**

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| **Company** | **Response** | **Comments** |
| **CATT** | **Yes but** | **We’re fine with the changes except the first change as we think it’s sufficient only refer to TS 22.011.** |
| **Nokia** | **Yes** | **Also CATT proposal is fine – no strong opinion** |
| **Apple** | **Yes**  | **If agreeable, we prefer to incorporate/merge the changes in R2-2007097 also in this rapporteur CR.** |
| **vivo** | **Yes** | **Ok for the four changes.** |
| **Huawei** | **Yes** |  |
| **LG** | **Yes** | **We are fine with the changes and WI code of R2-2007963 should be updated from TEI16.** |
| **Lenovo** | **Yes but** | Cover page issue: WI code should be corrected to “TEI16” (w/o dash).We agree with CATT that reference to TS 22.261 can be removed and its reference [12] in subclause 2 can be voided. |
| **MediaTek** | **Yes** |  |

**Summary:**

**Proposal:**

## 2.3 Srlev correction for inter-RAT (R[2-2007119](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007119.zip))

R2-2007119 (Rel-15 Cat F) and R[2-2007120](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007120.zip) (Rel-16 Cat A) for 36.304 introduce two missing parameters *q-QualMinOffsetCell and q-RxLevMinOffsetCell* in Srxlev calculation. These parameters are broadcast in NR SIB5 for inter-RAT cell reselection. However, they are not present in the Srxlev formula in 36.304.

The exact changes are copied here for reference:

|  |  |
| --- | --- |
| Qrxlevmin | Minimum required RX level in the cell (dBm)If Qrxlevminoffsetcell is signalled in NR SIB5 in TS 38.331[37] for the concerned cell, this cell specific offset is added to achieve the required minimum RX level in the concerned cell. |
| Qqualmin | Minimum required quality level in the cell (dB)If Qqualminoffsetcell is signalled is signalled in NR SIB5 in TS 38.331 [37] for the concerned cell, this cell specific offset is added to achieve the required minimum quality level in the concerned cell. |

**Do you agree to the above changes in LTE Srxlev calculation? If not, please provide justification and/or alternative options.**

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| --- | --- | --- |
| **Company** | **Response** | **Comments** |
| **CATT** | **Yes** | Qrxlevminoffsetcell /Qqualminoffsetcell is introduced in NR R15, but also applied to Inter-RAT cell reselection. It’s still unclear how these parameters are used in 36.304, so we’re fine with the clarification. |
| **Nokia** | **Proponent** |  |
| **Apple** | **Agree** | **If the CR is disagreed, the two parameters (*q-QualMinOffsetCell and q-RxLevMinOffsetCell)* in NR SIB5 for inter-RAT cell selection will not be used by the UE for cell reselection from NR to LTE.** |
| **vivo** | **Yes** | **It is reasonable to use these two parameters to apply a more precise cell offset in inter-RAT cell reselection.** |
| **Huawei** | **Yes, but** | **1) The consequence if not approved is a bit severe if this is a "clarification" CR only. Either this or the CR title needs to be updated - is it a critical correction or just clarification?****2) The field descriptions in 38.331 refer to 38.304 so that should be corrected to 36.304. Maybe this can be fixed in 38.331 rapporteur CR if there’s one?****3) We have some suggestion on the wording:**Minimum required RX level in the cell (dBm)When the UE is camped on an NR cell and evaluating an E-UTRAN cell, and Qrxlevminoffsetcell is signalled in NR SIB5 in TS 38.331[37] for the E-UTRAN cell, this cell specific offset is added to achieve the required minimum RX level in the E-UTRAN cell.Minimum required quality level in the cell (dB)When the UE is camped on an NR cell and evaluating an E-UTRAN cell, and Qqualminoffsetcell is signalled is signalled in NR SIB5 in TS 38.331 [37] for the E-UTRAN cell, this cell specific offset is added to achieve the required minimum quality level in the E-UTRAN cell.**We understand that the current text has some implicit reference to the scenario where “UE is camped on an NR cell and evaluating an E-UTRAN cell”, but we still prefer to make it clear so that the UE will not feel confused why NR SIB5 is referred to when evaluating an LTE cell.****This enhancement is introduced in NR SIB3/4/5 and now affecting LTE spec. However, it has no impact on SIB24 of LTE, only SIB5. Generally, SIB24 is closely related to NR whereas for SIB5 it is not so straightforward. We’re ok to leave SIB24 as it is and prefer to make the description in SIB5 easier to understand.** |
| **LG** | **Yes** | **We are fine with the change and Huawei’s text proposal seems better to directly show the intention of the sentence. (Editorial change seems needed in Huawei’s text proposal).** |
| **Lenovo** | **No** | Cover page: why is NE-DC/NR-DC listed in “Impacted 5G architecture options”? The CR refers to inter-RAT cell reselection from NR SA to LTE.We prefer a simpler solution by correcting the concerned field descriptions in 38.331 SIB5 as the current descriptions are not correct, see below.***q-QualMinOffsetCell***Cell specific quality level offset to Qqualmin in TS 36.304 [7]. Value in dB.***q-RxLevMinOffsetCell***Cell specific Rx level offset to Qrxlevmin in TS 36.304 [7]. Value in dB. |
| **MediaTek** | **Yes, but** | * We are not sure if NR parameter needs to be included in LTE spec, but we a fine with such clarifications.
* If this CR is agreed, we may also need to include parameters in LTE SIB24 in 38.304?
 |

**Summary:**

**Proposal:**

## 2.4 Qrxlevmin correction in SIB24 (R[2-2008040](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2008040.zip))

R[2-2008040](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2008040.zip) (Rel-15 Cat F) and R[2-2008041](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2008041.zip) (Rel-16 Cat A) for 36.304 corrects the values of *q-RxLevMin* and *q-RxLevMinSUL* broadcast in LTE SIB24 for inter-RAT cell re-selection. The values for these two parameters are signaled as INTEGER (-70..-22). However, the corresponding dBm values are not stated in the field descriptions. The changes are copied here for reference:

|  |
| --- |
|  ***q-RxLevMin***Parameter "Qrxlevmin" in TS 36.304 [4], applicable for NR neighbour cells. The actual value of this field is calculated from Qrxlevmin = field value \* 2 [dBm]. |
| ***q-RxLevMinSUL***Parameter "QrxlevminSUL" in TS 38.304 [92], applicable for NR neighbouring cells. The actual value of this field is calculated from QrxlevminSUL = field value \* 2 [dBm]. |

**Do you agree to the above changes to the field descriptions in SIB24? If not, please provide justification and/or alternative options.**

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| --- | --- | --- |
| **Company** | **Response** | **Comments** |
| **CATT** | **Maybe no** | We think the following IE definition is already clear enough*Q-RxLevMin* The IE *Q-RxLevMin* is used to indicate for cell selection/ re-selection the required minimum received RSRP level in the (E-UTRA) cell. Corresponds to parameter Qrxlevmin in TS 36.304 [4]. Actual value Qrxlevmin = field value \* 2 [dBm]. |
| **Nokia** | **With modification** | **the same field is used in at least two places. Better to introduce separate IE and in the IE description have this “\*2” similarly as in NR** |
| **Apple** | **With modification** | 1. **The sentence can be updated as follow:**

**Actual value Qrxlevmin = field value \* 2 [dBm].**1. **In *q-RxLevMin* filed description, the reference spec should be updated to TS 38.304.**
 |
| **vivo** | **No strong view** | **The text either by Qualcomm or Apple is acceptable to us.** |
| **Huawei** | **Yes** | **The change is reasonable. The similar description should be added to q-QualMin, indicating that the actual value = field value [dB] (in this case no need to be multiplied by 2).** |
| **LG** | **Yes** | **We prefer simpler expression suggested by Apple.** |
| **Lenovo** | **Yes with changes** | Cover page: WI code should be corrected “NR\_newRAT-Core” as SIB24 was introduced as part of NR SA.On the changes in the field descriptions: we are fine with the changes as IE type of both fields has been defined as Integer value range and not as IE Q-RxLevMin. Furthermore, we prefer the shortened form as proposed by Apple. Reason is that the QC proposal is misleading as the actual value should apply to the referenced parameter in 36.304/38.304 or not to the field itself.In this context, we spotted an issue in the description of q-RxLevMinSUL: the parameter "QrxlevminSUL" does not exist neither in TS 36.304 nor in TS 38.304 [92]. In NR spec, 5.2.3.2 it is stated that Qrxlevmin is obtained from q-RxLevMinSUL if present, in SIB1, SIB2 and SIB4. Therefore, "QrxlevminSUL" should be replaced by "Qrxlevmin". |
| **MediaTek** | **Yes** | Agree with Apple. |

**Summary:**

**Proposal:**

## 2.5 Suitable cell definition (R[2-2007097](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007097.zip))

R[2-2007097](file:///G%3A%5C3GPP%E6%96%87%E6%A1%A3%5C2020%E5%B9%B4%5CRAN2%20111-e%5CDocs%5CR2-2007097.zip) (Cat D) suggests editorial corrections as follows:

1. Added 3GPP TS 22.011 to reference list
2. In the definition of “suitable cell”, added “for Romaing” to the list of “Forbidden Tracking Areas”.
3. The reference to TS 22.261 is replaced by the reference to TS 22.011
4. “Registration area” changes to “tracking area” in the description of exception case in clause 4.5

The changes 1 and 3 are already covered in R2-2007963.

The remaining two changes are copied here for reference as below:

|  |
| --- |
| **suitable cell:**A cell is considered as suitable if the following conditions are fulfilled:- The cell is part of either the selected PLMN or the registered PLMN or PLMN of the Equivalent PLMN list;- The cell selection criteria are fulfilled, see clause 5.2.3.2.According to the latest information provided by NAS:- The cell is not barred, see clause 5.3.1;- The cell is part of at least one TA that is not part of the list of "Forbidden Tracking Areas for Roaming" (TS 22.011 [xx]), which belongs to a PLMN that fulfils the first bullet above.**reserved cell:**A cell is reserved if it is so indicated in system information, as specified in TS 38.331 [3].Following exception to these definitions are applicable for UEs:- if a UE has an ongoing emergency call, all acceptable cells of that PLMN are treated as suitable for the duration of the emergency call.- camped on a cell that belongs to a tracking area that is forbidden for regional provision of service; a cell that belongs to a tracking area that is forbidden for regional provision service (TS 23.122 [9], TS 24.501 [14]) is suitable but provides only limited service. |

In 24.501, the following is stated in Section 5.3.13:

|  |
| --- |
| The UE shall store a list of "5GS forbidden tracking areas for roaming", as well as a list of "5GS forbidden tracking areas for regional provision of service". Within the 5GS, these lists are managed independently per access type, i.e., 3GPP access or non-3GPP access. These lists shall be erased whena) the UE is switched off or the UICC containing the USIM is removed or an entry of the "list of subscriber data" with the SNPN identity of the current SNPN is updated; andb) periodically (with a period in the range 12 to 24 hours). |

Therefore, the proposed changes do align 38.304 and 24.501. It should be noted that 36.304 also uses the term “registration area that is forbidden for regional provision of service” which may need to be corrected.

If these changes are agreed, they should be merged with the Rapporteur CR for 38.304. The same can also be done for 36.304.

**Do you agree to the changes 2 and 4 above for camping on forbidden cells? If not, please provide justification and/or alternative options.**

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| **Company** | **Response** | **Comments** |
| **CATT** | **No strong view** |  |
| **Nokia** |  | **Seems technically correct. If agreed probably better to have same in release 16 36.304 – but there should not be need to propagate this to earlier releases as this is purely editorial. Considering this change does not seem to be critical as anyway even for NR only release 16 is being proposed.** |
| **Apple** | **Agree** | **1. For change 2: please note that this change just aligns the suitable cell definition to the text in TS 36.304, as “forbidden tracking area for roaming” also used in clause 4.3 in 36.304 as below:*****According to the latest information provided by NAS:******- The cell is not barred, see clause 5.3.1;******- The cell is part of at least one TA that is not part of the list of "forbidden tracking areas for roaming" TS 22.011 [4], which belongs to a PLMN that fulfils the first bullet above;*****Otherwise, if “for roaming” is not added, a UE might also consider the “Forbidden Tracking Areas for regional provision of service” during Cell suitability check and would re-select to a (potentially weaker) cell of another TA which is violating the intention of the concept of “regional provision of service” where the UE shall not trigger any attempts to leave the current camped cell neither on AS nor on NAS level.** **2. For change 4, the term used in AS and NAS spec should be aligned.**  |
| **vivo** | **Agree** | **We are fine with the changes after further explanation by Apple.** |
| **Huawei** | **Go to the rapporteur CR** | **This is a resubmission of R2-2004752. In the previous meeting it was agreed that “Contents is agreeable but editorial, to be merged into 38304 rapporteur CRs at next meeting, these CRs are not agreed.”** |
| **LG**  | **Agree** | **Agree to align the terms with NAS spec which are changed in NR.** |
| **Lenovo** | **No** | To change 2: we understand that the phrase “list of Forbidden Tracking Areas” is a general placeholder for "list of 5GS forbidden TAs for roaming" in case of NR cell and "list of forbidden TAs for roaming" in case of LTE cell. Therefore, we see no need to add “roaming”.To change 4: Registration area includes one or more tracking areas. Therefore, the concerned sentence should be understood as a generic sentence and thus, there is no need for any change. |
| **MediaTek** | **Yes** |  |

**Summary:**

**Proposal:**

**If change 4 is accepted, do you agree to also applying this to 36.304 to be introduced in the Rapporteur CR?**

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| --- | --- | --- |
| **Company** | **Response** | **Comments** |
| **Apple** | **Agree** | **We are fine to merge the change 4 in the 36.304 Rapporteur CR (R2-2007064).** |
| **vivo** | **Agree** |  |
| **MediaTek** | **Yes** |  |

**Summary:**

**Proposal:**

# Conclusion

Based on the feedback received, the following are proposed regarding the corrections for Idle/Inactive operation in LTE and NR:

**Proposal:**

# Contact information

|  |  |
| --- | --- |
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