3GPP RAN WG2 Meeting #119bis-e R2-22xxxxx

eMeeting Octorber 10th – 19th, 2022

Agenda Item: 6.10.4.1

Source: ZTE corporation,Sanechips

Title: Report of [AT119bis-e][112][NR NTN] idle mode corrections (ZTE)

Document for: Discussion, Decision

# Introduction

This document is intended address a subset of remaining idle mode open issues as per the following email discussion guidelines:

* [AT119bis-e][112][NR NTN] idle mode corrections (ZTE)

Initial scope: Discuss idle mode corrections in AI 6.10.4.1

Initial intended outcome: Summary of the offline discussion with e.g.:

* List of proposals for agreement (if any)
* List of proposals that require online discussions
* List of proposals that should not be pursued (if any)

Deadline (for companies' feedback): Thursday 2022-10-13 14:00 UTC

Deadline (for rapporteur's summary in R2-2210854): Thursday 2022-10-13 16:00 UTC

Proposals marked "for agreement" in R2-2210854 not challenged until Friday 2022-10-14 10:00 UTC will be declared as agreed via email by the session chair (for the rest the discussion might continue online).

**The following contributions will be treated in this offline discussion:**

[R2-2209504](file:///C:\Data\3GPP\Extracts\R2-2209504%20Correction%20on%20the%20list%20of%20PLMNs%20not%20allowed%20to%20operate%20at%20the%20present%20UE%20location%20in%20TS%2038.304.docx) Correction on the list of "PLMNs not allowed to operate at the present UE location" in TS 38.304 vivo CR Rel-17 38.304 17.2.0 0283 - F NR\_NTN\_solutions-Core

[R2-2210569](file:///C:\Data\3GPP\Extracts\R2-2210569%20CR%20corrections%20for%2038304.docx) Corrections to TS 38.304 for Rel-17 NR NTN Samsung Research America CR Rel-17 38.304 17.2.0 0291 - F NR\_NTN\_solutions-Core

[R2-2210584](file:///C:\Data\3GPP\Extracts\R2-2210584.docx) Correction on cell status for NTN Google Inc. CR Rel-17 38.304 17.2.0 0292 - F NR\_NTN\_solutions-Core

[R2-2210640](file:///C:\Data\3GPP\Extracts\38304_CR0293_(Rel-17)_R2-2210640%20Corrections%20to%20the%20Reselection%20Priority%20Handling%20for%20NTN.docx) Corrections to the Reselection Priorities Handling for NTN Google Inc. CR Rel-17 38.304 17.2.0 0293 - F NR\_NTN\_solutions-Core

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# Discussion

## R2-2209504 Correction on the list of "PLMNs not allowed to operate at the present UE location"

The following changes have been proposed in R2-2209504:

In 4.2, Table 4.2-1, remove the descriptions that NAS maintains and indicates the list of “PLMNs not allowed to operate at the present UE location” to AS in the cell selection and cell reselection rows.

|  |  |  |
| --- | --- | --- |
| Cell  Selection | Control cell selection for example by indicating RAT(s) associated with the selected PLMN to be used initially in the search of a cell in the cell selection.  Maintain a list of "Forbidden Tracking Areas" and provide the list to AS.  For a UE not operating in SNPN access mode: Maintain Allowed CAG list and optional CAG-only indication along with associated PLMN ID(s) on which the UE is allowed access and provide these lists to AS. To support manual CAG selection, select a CAG and request AS to select a cell belonging to this CAG. | Perform measurements needed to support cell selection.  Detect and synchronise to a broadcast channel. Receive and handle broadcast information. Forward NAS system information to NAS.  Search for a suitable cell. The cells broadcast one or more 'PLMN identity' or 'SNPN identity' (for a UE operating in SNPN access mode) in the system information. Respond to NAS whether such cell is found or not.  If associated RATs is (are) set for the PLMN, perform the search in this (these) RAT(s) and other RATs for that PLMN as specified in TS 23.122 [9].  If a cell is found which satisfies cell selection criteria, camp on that cell. |
| Cell  Reselection | For a UE not operating in SNPN access mode,  maintain a list of equivalent PLMN identities and provide the list to AS.  Maintain a list of "Forbidden Tracking Areas" and provide the list to AS.  For a UE not operating in SNPN access mode, maintain Allowed CAG list and optional CAG-only indication along with associated PLMN ID(s) on which the UE is allowed access and provide these lists to AS.  Maintain slice information including NSAG(s) and their priorities and provide this information to AS. | Perform measurements needed to support cell reselection.  Detect and synchronise to a broadcast channel. Receive and handle broadcast information. Forward NAS system information to NAS.  Change cell if a more suitable cell is found.  Derive cell reselection priorities for slice-based cell reselection. |

**Question 1) Do companies agree with the above proposed changes in R2-2209504? If no, please indicate which change is not acceptable and the reasons in the “comments” column.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | Yes | We either can remove the whole sentence or the part on ‘and provide the list to AS’. |
| MediaTek | Yes |  |
| Xiaomi | Yes |  |
| vivo | Yes | Proponent. |
| OPPO |  | We don’t have strong view as the current spec seems to be a compromise in RAN2#118e that RAN2 only capture the list in the table but not capture related procedures for cell selection. |
| ITRI | Yes |  |
| Google | Yes, but | Although we agree that the list of “PLMNs not allowed to operate at the present UE location” has no impact to the AS layer, we think the NAS should maintain such a list in PLMN Selection/Cell Selection/Cell Reselection phases. Therefore, the only thing needs to be strikeout is “and provide the list to AS”. |
| Intel |  | ok to follow majority |
| Samsung | See comment | Agree to remove “and provide the list to AS” |
| China Telecom |  | We prefer to just remove” and provide the list to AS” |
| Lenovo |  | Agree with OPPO. The original TP was an outcome from RAN2#118. |
| CATT | Yes | Agree with nokia. |
| Huawei, HiSilicon |  | We have some sympathy with OPPO and Lenovo’s comments.  The sentence in the table is not a mistake, rather, it was discussed carefully in RAN2 #118-e. Back then, there were some voices to not add the sentence because there is not action for AS layer after receiving the list. On the other hand, it brings to harm to provide the list to AS and it is up to UE implementation how the AS will treat the list, and the sentence was eventually approved.  Therefore, we prefer not to duplicate the discussion and leave the spec as it is. But if majority wants to delete it, we can also accept that. |
| Ericsson |  | Change is fine |
| Qualcomm | No | We agree with Huawei. This is not mistake. This is under the “NAS” column. |
| LGE | Yes | All sentence shall be removed (not partly), because for PLMN selection process, we already have “Maintain a list of "PLMNs not allowed to operate at the present UE location". |
| Apple | No | We agree with Huawei and Qualcomm. This sentence is added after a careful discussion, and how to use the list in AS layer is up to UE implementation. |
| ZTE | No | Agree with Huawei, Qualcomm, and Apple that this senstence is added after careful discussion. Since there is no harm to have this sentence and we do not specify the expected AS behaviour upon reception of this list, we understand we can still leave the current description as it is. |
| NEC | No strong opinion | Technically it is not needed, but it is not a mistake/bad consequence to keep it |

## R2-2210569 Corrections to TS 38.304 for Rel-17 NR NTN

The following changes have been proposed in R2-2210569:

* Change 1: Include “PLMNs not allowed to operate at the present UE location” in NAS related description in 5.2.1.
* Change 2: Add parameters introduced for NTN cell reselection in 5.2.4.7.0
* Change 3: Editorial changes in 5.2.4.2.

**Question 2) Do companies agree with the above proposed changes in R2-2210569? If no, please indicate which change is not acceptable and the reasons in the “comments” column.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | No to Change 1 | No need to add this sentence in multiple places in the specs. Changes 2 and 3 are OK. |
| MediaTek | No to Change 1 | This is not needed. |
| Xiaomi | No to change 1 |  |
| Vivo | No to change 1;  OK with change 2 and change 3 | Section 5.2.1 is an introduction to cell selection and cell reselection, since the consensus reached in RAN2 was that cell selection and cell reselection are not actually impacted by “PLMNs not allowed to operate at the present UE location”, the related description about this PLMN list should not be added in section 5.2.1. |
| OPPO | No to Change 1 | Change 2/3 are acceptable. |
| ITRI | No to Change 1 | We don’t think Change 1 is necessary since it is included in NAS spec.  Change 2 and 3 are OK. |
| Google | OK with change 2 and 3 |  |
| Intel | OK with change 2 and 3 |  |
| Samsung | Yes | The proposed change 1 is as follows.  “The NAS can control the RAT(s) in which the cell selection should be performed, for instance by indicating RAT(s) associated with the selected PLMN, and by maintaining a list of forbidden registration area(s), a list of equivalent PLMNs, and a list of PLMNs not allowed to operate at the present UE location. The UE shall select a suitable cell based on RRC\_IDLE or RRC\_INACTIVE state measurements and cell selection criteria.”  We think the change is proper. But we can go with majority view. |
| Lenovo | OK with Change 2 and 3 |  |
| CATT | No change 1 and 2 | For change 1, we agree with vivo;  For change 2, the parameter “distanceThresh” and “referenceLocation” is used for initiate the measurement on neighbour cells, it doesn’t belong to the cell reselection procedure strictly. |
| Huawei, HiSilicon | Ok with Change 2/3, no strong view on Change 1 |  |
| Ericsson | Not needed |  |
| Qualcomm | Ok with change 1 | We agree with Sansung.  The change 2 and 3 are non-essential. We should try to avoid such. |
| LGE | Yes for change 2 and 3 | For change1, the information maintaind by NAS is already listed as example, see the existing text saying “for instance” . So no addition is needed.  *5.2.1. The NAS can control the RAT(s) in which the cell selection should be performed, for instance by indicating RAT(s) associated with the selected PLMN, and by maintaining a list of forbidden registration area(s) and a list of equivalent PLMNs. The UE shall select a suitable cell based on RRC\_IDLE or RRC\_INACTIVE state measurements and cell selection criteria.* |
| Apple | OK with Change 1/2/3 |  |
| ZTE |  | We understand the proposed changes are not essential but acceptable if the majority is fine to have them. |
| NEC | No to change 1  Ok with other two changes |  |

## R2-2210584 Correction on cell status for NTN

-----------------------------------------------Proposed change in R2-2210584-----------------------------------------------

**5.3.1 Cell status and cell reservations**

Cell status and cell reservations are indicated in the *MIB or SIB1* message as specified in TS 38.331 [3] by means of following fields:

*cellBarred* (IE type: "barred" or "not barred")   
Indicated in *MIB* message. In case of multiple PLMNs or NPNs indicated in *SIB1*, this field is common for all PLMNs and NPNs. For NTN access, this field is ignored.

-----------------------------------------------Proposed change in R2-2210584-----------------------------------------------

**Question 3) Do companies agree with the above proposed changes in R2-2210584? If no, please explain the reasons in the “comments” column.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | No strong view | The change seem to be correct, but the message conveyed without those changes is practically the same. |
| MediaTek | No strong view | The texts before and after changes essentially mean the same. |
| Xiaomi | Yes | In the CR, the reason for change is as below:  *When the cellBarredNTN is not included in SIB1, a UE does not ignore the cellBarred field. Which means the cell status is according to cellBarred while the cellBarredNTN is not included in SIB1. When the cellBarred value is “not barred”, a UE treats the cell as not barred for NTN access.*  For the sentence marked with yellow, we have different understanding:  When the cellBarred value is “not barred”, a UE treats the cell as not barred for TN access, since the absence of cellBarredNTN means the cell is barred for NTN access.  So the current description in TS38.304 is correct, however, the change seems more clearly and the UE behaviour is in line with the agreements. If the CR is agreed, the field description in TS38.331 also needs to be changed. |
| vivo | Yes | We think it’s better to align with TS 38.331, but we can follow majorities. |
| OPPO | No | No need for the change as the current spec is clear. |
| ITRI | Yes | We agree with the change to make it clear to align with RAN2 agreements and TS 38.331. |
| Google | Yes | [Proponent] For NTN access, the UE will anyway consider the cell as being barred regardless of the value in *cellBarred*, if *cellBarredNTN* is not present. |
| Intel |  | ok to follow majority |
| Samsung | Yes | The change seems more clear. |
| China Telecom | No strong view |  |
| Lenovo | No strong view |  |
| CATT | Yes | We can accept this modification. |
| Huawei, HiSilicon | No strong view |  |
| Ericsson | Not needed | Agree with Oppo |
| Qualcomm | No | We do not see any issue with current text. Current text is clear. We should avoid unnecessary change. |
| LGE | Yes | We think the change is correct. According to the current text, if cellBarredNTN is not present, the NTN access UE seems to follow cellBarred, which then is not in line with what is specified in 331 where the cellBarred shall be ignored by NTN access. |
| Apple | No strong view | The current text in the spec is not wrong. The change is just to improve the wording. |
| ZTE | No strong view | We do not see any issue with the current spec but fine with the proposed change if the majority want to have it. |
| NEC | Yes | Based on following filed description, we understand that cellBarredNTN is always present in an NTN cell. Then the current text is not wrong, but the updated text looks cleaner.  ***cellBarredNTN***  Value *barred* means that the cell is barred for connectivity to NTN, as defined in TS 38.304 [20]. Value *notBarred* means that the cell is allowed for connectivity to NTN. If not present, the UE considers the cell is not allowed for connectivity to NTN, as defined in TS 38.304 [20]. This field is only applicable to NTN-capable UEs. |

## R2-2210640 Corrections to the Reselection Priorities Handling for NTN

-----------------------------------------------Proposed change in R2-2210640-----------------------------------------------

**5.2.4.1 Reselection priorities handling**

Absolute priorities of different NR frequencies or inter-RAT frequencies may be provided to the UE in the system information, in the *RRCRelease* message, or by inheriting from another RAT at inter-RAT cell (re)selection. In the case of system information, an NR frequency or inter-RAT frequency may be listed without providing a priority (i.e. the field *cellReselectionPriority* is absent for that frequency). If any fields with *cellReselectionPriority* or *nsag-CellReselectionPriority* are provided in dedicated signalling, the UE shall ignore any fields with *cellReselectionPriority* and *nsag-CellReselectionPriority* provided in system information.

When UE is in camped normally state, if it supports slice-based cell reselection and has received NSAG(s) and their priorities from NAS, UE shall derive re-selection priorities according to clause 5.2.4.11.

If UE is in *camped on any cell* state, UE shall only apply the priorities provided by system information from current cell, and the UE preserves priorities provided by dedicated signalling and *deprioritisationReq* received in *RRCRelease* unless specified otherwise. When the UE in camped normally state, has only dedicated priorities other than for the current frequency, the UE shall consider the current frequency to be the lowest priority frequency (i.e. lower than any of the network configured values). When the HSDN capable UE is in High-mobility state, the UE shall always consider the HSDN cells to be the highest priority (i.e., higher than any other network configured priorities). When the HSDN capable UE is not in High-mobility state, the UE shall always consider HSDN cells to be the lowest priority (i.e., lower than any other network configured priorities). If the UE is configured to perform both NR sidelink communication and V2X sidelink communication, the UE may consider the frequency providing both NR sidelink communication configuration and V2X sidelink communication configuration to be the highest priority. If the UE is configured to perform NR sidelink communication and not perform V2X communication, the UE may consider the frequency providing NR sidelink communication configuration to be the highest priority. If the UE is configured to perform V2X sidelink communication and not perform NR sidelink communication, the UE may consider the frequency providing V2X sidelink communication configuration to be the highest priority.

NOTE 0a: The frequency only providing the anchor frequency configuration should not be prioritized for V2X service during cell reselection, as specified in TS 38.331[3].

NOTE 0b: When UE is configured to perform NR sidelink communication or V2X sidelink communication performs cell reselection, it may consider the frequencies providing the intra-carrier and inter-carrier configuration have equal priority in cell reselection.

NOTE 0c: The prioritization among the frequencies which UE considers to be the highest priority frequency is left to UE implementation.

NOTE 0d: The UE is configured to perform V2X sidelink communication or NR sidelink communication, if it has the capability and is authorized for the corresponding sidelink operation.

NOTE 0e: When UE is configured to perform both NR sidelink communication and V2X sidelink communication, but cannot find a frequency which can provide both NR sidelink communication configuration and V2X sidelink communication configuration, UE may consider the frequency providing either NR sidelink communication configuration or V2X sidelink communication configuration to be the highest priority.

NOTE 0f: Void.

The UE shall only perform cell reselection evaluation for NR frequencies and inter-RAT frequencies that are given in system information and for which the UE has a priority provided.

If the NTN capable UE receives a NR frequency for a neighbour cell in SIB19 and this NR frequency is neither the serving frequency nor the frequency provided in SIB4, the UE shall consider the priority of the NR frequency to be identical to that of the serving frequency, and the SSB periodicity of the NR frequency to be identical to that of the serving frequency.

-----------------------------------------------Proposed change in R2-2210640-----------------------------------------------

**Question 3) Do companies agree with the above proposed changes in R2-2210640? If no, please explain the reasons in the “comments” column.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Nokia | No | We are not convinced this is a real scenario (maybe with extremely bad NW implementation). So we do not think this has to be addressed. |
| MediaTek | No | This is an extereme case and is not likely to happen. |
| vivo | No | We don’t think the case that an NR frequency for a neighbour cell is provided in SIB19 but this NR frequency is neither the serving frequency nor the frequency provided in SIB4 really exists; a smart network will not provide such configuration. |
| OPPO | No | This is an extereme case and can be avoid by NW implementation. |
| ITRI | No | We think this is an extreme case and could be avoid by network. |
| Google | Yes | [Proponent] This is one of the easiest handling for the case where the neighboring cell information included in SIB19 contains a carrier frequency that is neither the serving frequency nor any of the frequencies provided in SIB4.  The NW may also benefit from such a UE behaviour, as the NW may omit the configurations in SIB4 for those frequencies having the same priority and same SSB periodicity as the serving freqeuency does. |
| Intel | No | This case can be avoid by NW implementation. |
| Samsung | No | Seems the last sentence already rules out the proposed scenario.  “The UE shall only perform cell reselection evaluation for NR frequencies and inter-RAT frequencies that are given in system information and for which the UE has a priority provided.” |
| China Telecom | No | This case can be avoided by NW implementation |
| Lenovo | No | This is a rare case and can be handled by NW implementation. |
| CATT | No | This can be avoided by network implementation. |
| Huawei, HiSilicon | No | Agree with other companies that this can be avoided by NW implementation. |
| Ericsson | No |  |
| Qualcomm | No | Common reselection parameters are in SIB3. |
| LGE | No | Agree with Nokia and Samsung |
| Apple | No | This case should be avoided by NW implementation. |
| ZTE | No | The case can be avoided by NW implementation. |
| NEC | No |  |

# Conclusions

<To be generated based on company input>

# References

1. R2-2209504 Correction on the list of "PLMNs not allowed to operate at the present UE location" in TS 38.304 vivo
2. R2-2210569 Corrections to TS 38.304 for Rel-17 NR NTN Samsung Research America
3. R2-2210584 Correction on cell status for NTN Google Inc.
4. R2-2210640 Corrections to the Reselection Priorities Handling for NTN Google Inc.