3GPP TSG-RAN WG2 #116bis-e R2-220xxxx

Electronic meeting, Jan 17st - 25th, 2022

Agenda Item: 9.2.1

Source: Ericsson

Title: Report of [Post-116bis-e][088][IoT-NTN] 36304 open issues

Document for: Discussion, Decision

# Introduction

This document serves as a summary of the following offline discussions:

* [Post116bis-e][088][IoT NTN] 36304 (Ericsson)

Scope: Updated running CR taking into account agreements of R2-116bis-e. Best effort review. Endorsement if possible. Capture TS related Open Issues, not captured elsewhere and suggest how to treat.

Intended outcome: Updated Running CR, reviewed, baseline for next meeting. TS related Open issue with suggestion how to treat.

Deadline: Short.

This e-mail discussion serves to treat how the open issues related to idle mode should be treated in the next meeting according to (and should not be a discussion on whether a feature should be introduced or not):

* **Each open issue** should be associated with **suggested treatment/handling**.
  1. **Company input into Pre117-e-offline (i.e. no company tdocs)**
  2. Company tdocs invited.
  3. CR rapporteur handled issue (CR rapporteur will propose resolution as input to next meeting).
  4. Other, e.g. immature area, reference to dependency, unclear status etc.

The idle mode running CR can be found in [1].

# Contact info

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email** |
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| ZTE | Lu Ting | lu.ting@zte.com.cn |

# Discussion

## Open CR issues

In the CR the following is captured regarding t-service for LTE-M:

Editor’s Note: FFS whether *t-Service* applies to higher priority frequencies.

It was brought up during online discussions in RAN2#116-e, but it was not addressed by any contribution in RAN2#116bis-e. We think that this can be addressed in Pre117-e-offline as it is mainly for companies to check whether it should apply or not.

**Open issue: FFS whether t-Service applies to higher priority frequencies.**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| OPPO | No | We can refer to the agreement made for NR NTN in this meeting.  For quasi-earth fixed cell, eMTC UE shall perform neighbour cell measurements of higher priority E-UTRAN inter-frequency or inter-RAT frequencies regardless of the remaining serving time. |
| Huawei, HiSilicon | Yes |  |
| ZTE | No strong view. | We tend to agree with OPPO this may not be a issue.  Even without NR NTN agreement, in our understanding, UE may need to perform neighbour cell measurements of higher priority frequencies regardless of whether or not serving cell would stop serving.  If companies think a specific agreement is needed on this, we are fine to list it as an open issue. |
| Qualcomm | No | Agree with OPPO.  When the UE triggers measurement for whatever reason, frequency priority is used.  But discussion is whether, in the first place, NB-IoT and UE in enhanced coverage supports frequency priorities for cell reselection. |
| Ericsson | No strong view | It seems that NR NTN has already agreed on the matter and similar can be done for IoT NTN. |

**Summary:**

The views seem to be that it should be resolved similar to how it was resolved for NR NTN. Given the responses above, we suggest to make the Open issue a CR-rapporteur handled issue, where the t-Service will apply to higher priority frequencies.

**Open issue: FFS whether t-Service applies to higher priority frequencies.**

## Open issues related to editors notes

Regarding discontinuous coverage the following is captured:

Editor’s Note: *Agreement*: It is FFS to what extent it need to be specified the details of UE’s prediction of discontinuous coverage and its ability to detect when it is back in coverage.

Editor’s Note: *Agreement*: The details of Ues actions when predicted to be out of coverage is FFS, e.g stopping unnecessary cell search in the idle mode, and FFS to what extent this need to be specified.

There were several contributions for RAN2#116bis-e that discussed possible needed solutions for discontinuous coverage, but since it was not discussed and the proposals are varying, we think it is sufficient to invite company tdocs for next meeting.

**Open issue: Any needed specified behaviour in idle mode for discontinuous coverage.**

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| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| OPPO | Yes | In our understanding, it is up to UE implementation to predict the satellite’s coverage based on UE’s GNSS capability and the satellite assistance information.  And when UE detects out of coverage using discontinuous coverage information, UE may stop cell search in Any Cell Selection state. |
| Huawei, HiSilicon | Yes | We think it could be handled in **Pre117-e-offline.** Aspects to discuss are cell search and handling of AS timers during out-of-coverage |
| ZTE | Yes |  |
| Qualcomm | Yes | Such behavior already exists when the UE is configured with PSM. |

**Summary:**

Rapporteur notes that there seems to be consensus regarding this to be addressed and as discontinuous coverage is discussed to be handled in Pre117-e-offline, then we think that this issue can also be considered as such.

**Open issue: Any needed specified behaviour in idle mode for discontinuous coverage.**

## Other open issues

Please indicate any other open issues related to idle mode CR (that cannot be resolved through comments on the running CR):

|  |  |
| --- | --- |
| **Company** | **Comments** |
| ZTE | We think something may need to be captured in TS36.304 for the following agreement in RAN2#115e:   * UE does not do TAU if one of the currently broadcasted TAC belongs to UE’s registration area.   Moreover, in the following two descriptions, do we need to add some clarification for the IoT NTN case for ”when entering a new tracking area”? E.g., is there any difference for IoT NTN UE to determine whether it’s entering a new tracking area? 3.1 Definitions ***Location Registration (LR):*** *UE registers its presence in a registration area, for instance regularly or when entering a new tracking area*  *........*  4.2 Functional division between AS and NAS in Idle mode   |  |  |  | | --- | --- | --- | | ***Idle Mode Process*** | ***UE Non-Access Stratum*** | ***UE Access Stratum*** | | *...* | *...* | *....* | | *Location registration* | *Register the UE as active after power on.*  *Register the UE's presence in a registration area, for instance regularly or when entering a new tracking area.*  *Maintain lists of forbidden registration areas.*  *Deregister UE when shutting down.*  *Control and restrict location registration for a UE in eCall only mode.* | *Report registration area information to NAS.* | |
| Qualcomm | Whether existing offsets are sufficient to prioritize TN vs NTN frequencies as TN and NTN band, for sure will be different but that does not mean the frequencies will not be overlapped. |
|  |  |

**Summary:**

Two other open issues were mentioned.

One issue is on text for TAU procedures, where in legacy it is stated that a Location Registration will be performed when the UE enters a new tracking area, which changes for NTN as the agreement is that UE does not do TAU if one of the broadcasted TAC belongs to the registration area. Rapporteur will consider a suitable way to implement this for the next meeting:

**Open issue: Change/amend text on location registration related to TAU in NTN.**

The other issue is related to whether the existing offsets are sufficient to prioritize TN and NTN. We think that this can be addressed in contributions as it has not been addressed in meeting discussions to rapporteur’s knowledge.

**Open issue: Whether existing offset are sufficient to prioritize TN vs NTN frequencies.**

# Conclusion

We propose the following:

1. For idle mode open issues we have the following issues

* Open issue: FFS whether t-Service applies to higher priority frequencies.
* **Open issue: Any needed specified behaviour in idle mode for discontinuous coverage.**
* **Open issue: Change/amend text on location registration related to TAU in NTN.**
* **Open issue: Whether existing offset are sufficient to prioritize TN vs NTN frequencies.**

# Reference

1.