**3GPP TSG-RAN WG2 Meeting #131 R2-250xxxx**

**Bengaluru, India, 25th – 29th August 2025**

**Agenda item: 8.9.1**

**Source: Qualcomm Incorporated**

**Title: Open issues on Rel-19 IoT NTN UE capabilities**

**Document for: Discussion and Decision**

1. Introduction

This document lists the open issues for the Rel-19 IoT NTN TS 36.306 CR based on the following email discussion.

* [Post130][309][R19 IoT NTN] capability CR (Qualcomm)

 Scope: discuss the running capability CR

 Intended outcome: Endorsed CR and list of remaining open issues

 Deadline: long

1. Discussion

In the running CR, there are few editor’s note added.

**Contention-based Msg3:**

 Editor’s note: FFS on dependency on earlyData-UP-r15 and other capabilities such as support of the feature on non-anchor carrier. Name of parameter may be updated.

Editor’s note: FFS whether separate UE capability is needed for MT contention-based Msg3 EDT.

**Question 1**: For UP solution, network needs to provide NCC via RRC release message same as for UP EDT. For UP-based CB Msg3 transmission, should *nextHopChainingCount-r15* be reused or new NCC be introduced in RRC Release message?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
| Mediatek |  | Reuse the legacy IE. |
| Samsung |  | Reuse the legacy IE. Isnt this a question for RRC or how is this related to capabilities? |
| vivo |  | The existing RRC Release message can be reused.  |
| Ericsson |  | Re-use legacy |
| Apple |  | Reuse legacy. |
| ZTE |  | Reuse legacy. |
| Huawei |  | Reuse legacy. |
| Nokia |  | Reuse legacy |

Summary: Following is proposed.

1. *nextHopChainingCount-r15* in RRC Release message is reused for CB-Msg3 EDT using UP solution [7/7].

**Question 2**: Do we need a separate UE capability signaling for supporting MT contention-based Msg3 EDT?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comments |
|  | Yes | Legacy MT EDT is also optional.  |
| Samsung | Yes |  |
| vivo | Yes |  |
| Ericsson | No | We can reuse the existing MT UE capability, that is if CB-Msg3 is supported, then if legacy support MT, then also CB-Msg3 supports MT |
| Apple | Tend to yes |  |
| ZTE | No | Same view as Ericsson. |
|   | Yes | More clear |
| Nokia | No | Agree with Ericsson |

Summary: Two companies think the existing MT EDT UE capability can be reused for MT CB-Msg3 EDT.

1. Define new optional UE capability without signaling for the support of MT CB-Msg3 EDT for UEs supporting MO CB-Msg3 EDT [5/7].

**Support of PWS:**

Editor’s note: FFS whether to add eMTC here as this is currently under discussion in SA1 and CT1.

Editor’s note: FFS if it is also applicable in TN (even though it is possible signaling wise, SA1 may not have any requirements yet).

Rapporteur thinks RAN2 can wait for CT1 decision to confirm whether eMTC can use existing optional PWS capability without signaling or needs new Rel-19 capability signaling.

**Question 3**: Is the support of PWS in NTN extended to TN for NB-IoT? If yes, please explain if other working groups needed to be informed.

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| --- | --- | --- |
| Company | Yes/No | Comments |
| Mediatek | Yes | In the PWS WID objective, there is a note saying that“The solutions will be developed for NTN but can be applicable to TN (if possible). Specific NB-IoT TN optimizations will not be considered as part of this WI.”In our view, we should try to support PWS also for NB-IoT TN. There seems no much additional change at least in RAN2 part. We can check with other WG if needed but there should be no big delta compared to PWS in NB-IoT NTN. |
| Samsung | See comments | PWS was introduced for NB-IoT NTN because of how NB-IoT NTN has developed – we understand the use case of it. But we are not quite clear on what is the use case of supporting it in a terrestrial network. We are fine to support it if there is a strong need for it, but we do not think that “nice to have” is strong enough motivation. This is because there may be some issues as NB-IoT terrestrial networks are already deployed and operating.  |
| Ericsson | Yes | We understand that the changes introduced to support PWS (except for geofencing) are already applicable to TN. Thus, it would be simpler to have a single capability for both TN and NTN. |
| vivo | No | As is evident from the SA1 reply LS R2-2500045, the PWS requirement applies to IoT NTN but not to TN. Therefore, we propose that RAN2 should focus exclusively on NTN PWS. It is unreasonable to support PWS in IoT TN without coordination with SA. |
| Apple | See comment | My current understanding is there is no requirement for geofencing in TN for PWS, but SA1 does not explicitly say PWS is not supported for TN. We are checking with our SA1 colleague. |
| ZTE | Yes | We agree with Ericsson that signaling enhancement is already applicable to TN (no further spec impact). For UE capability, we think it’s no need to restrict the capability only for NTN.We haven’t seen potential impacts to other WGs. |
| Huawei | Yes | We already have the agreement that this can be applied to TN without extra spec effort. And we have already sent the agreements to other WGs in R2-2409243. So no need to further inform them. |
| Nokia | See comment | RAN2 agreed that: the support for PWS introduced for NB-IoT NTN can also be made applicable for NB-IoT in TN, if this does not require additional NB-IoT TN specific changes.Therefore, we are OK to support PWS in NB-IoT TN if there is no additional specific change for TN. |

One company think it is unreasonable to support PWS in IoT TN without coordination with SA. One company see no strong need for it and one company would like to further check. Rapporteur thinks it is useless exercise in RAN without SA1 requirement as it is evident from the recent PWS geofencing development. Rapporteur understands SA1 is currently waiting for RAN2’s confirmation to add NB-IoT TN in their PWS requirements.

1. RAN2 decide whether to inform SA1 that requirements for PWS support in NB-IoT terrestrial networks should be added.

**Support of store and forward:**

Editor’s note: FFS whether this capability is needed given S&F mode capability is already exchanged between UE and MME.

**Question 4**: Does RAN (i.e., eNB) needs to know UE’s radio capability whether it supports S&F mode operation?

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| --- | --- | --- |
| Company | Yes/No | Comments |
| Mediatek | No | There is no use case. |
| Samsung |  | Do not see a need for it for now.  |
| Ericsson | Yes | For example, it would be beneficial to configure mobility events (e.g., release with redirection) for those UEs in RRC\_CONNECTED before an operation mode switch. |
| vivo | No | We don’t see the necessity of having a Uu capability for S&F. |
| Apple | No | The operation defined in RAN2 is limited to RRC idle state and initial access. RAN node does not need to know this UE capability. |
| ZTE | Yes | There may be case that NW needs to know of UE’s capability of supporting S&F operation, for example, eNB operating S&F mode may not set legacy barring bit and later want to reject some of legacy UEs and accept S&F capable UEs. Also for future-proofing, it’s better to let eNB know such UE capability.Anyway, as there is already relevant NAS layer capability (S&F satellite operation (SFSO)->UE network capability->Attach request), it can be considered for the MME to inform the eNB about this capability. Therefore, at least for now, there is no need to introduce the UE capability in air interface. |
| Huawei | No |  |
| Nokia | No |  |

Two companies think that is it beneficial that RAN is aware of the UE’s S&F radio capability.

1. No UE radio capability signaling is introduced to indicate whether UE supports S&F mode operation [5/7].

**Question 5**: Any other issues for TS 36.306 CR on Rel-19 IoT NTN UE features?

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| --- | --- | --- |
| Company | Issues | Comments |
| Apple | OCC | RAN1 UE feature list says it is FDD only. It should be captured in UE capability spec.[Rapp] It should be ok to capture but NTN has no TDD support yet so implicitly it is for FDD. In RRC CR TDD/FDD diff column would “-“. |
|  |  |  |

1. TBD.
2. Conclusion

Following observation and proposals are made:

Proposal 1 *nextHopChainingCount-r15* in RRC Release message is reused for CB-Msg3 EDT using UP solution [7/7].

Proposal 2 Define new optional UE capability without signaling for the support of MT CB-Msg3 EDT for UEs supporting MO CB-Msg3 EDT [5/7].

Proposal 3 RAN2 decide whether to inform SA1 that requirements for PWS support in NB-IoT terrestrial networks should be added.

Proposal 4 No UE radio capability signaling is introduced to indicate whether UE supports S&F mode operation [5/7].

Proposal 5 TBD.