98e-29-R17-NTN-Performance - Version 0.0.2

RAN

https://nwm-trial.etsi.org/#/documents/8285

3GPP TSG RAN Meeting #98-e RP-223469

Electronic Meeting, December 12 - 16, 2022

Agenda Item: 9.5.2.2

Source: RAN Vice-Chair (AT&T)

Title: Moderator's summary for discussion [98e-29-R17-NTN-Performance]

Document Type: Report

Document for: Information & Decision

In this document, we will provide a summary for the email discussion [98e-29-R17-NTN-Performance] at RAN#98-e.

1 Topic #1: UL transmit timing test open issues

1.1 Proposed Objectives

Topic #1 will capture the outcome of the discussions on the following document:

1) RP-223368 [1]

1.2 Initial Round

The initial round will be focused on collecting company views to include any opposing views and/or concerns with the proposals set forth in the document above. Companies are also requested to provide any suggested way forwards to consider in future rounds of discussion if there are concerns with the document as presented.

1.2.1 Open Issues

The following covers the observations and proposals listed in [1].

Observation 1: Ephemeris information, common delay information and UE GNSS operation are essential parts of the solutions adopter for enabling NR communication over NTN.

Observation 2: The UL transmit timing is a major difference in NTN compared to terrestrial operations, and relevant aspects of the performance test remain as open issues.

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Observation 3: It remains unclear how the ephemeris information is to be configured in the test setup. In special, the specifications lack reference for satellite orbital information to be broadcast.

Observation 4: For a given position, differences in relative satellite position and distance may increase or decrease the test difficulty. If ephemeris is completely left for TE implementation, it might cause UEs to be tested under different conditions.

Proposal 1: RAN to extend the WI by a quarter to complete the remaining open issues.

Proposal 2: The objectives of the extension should include the definition on the GNSS aspect for the UL transmit timing test and the ephemeris (SIB19) configuration information for the RRM tests.

Based on the content of [1], the moderator proposes to discuss the following open issues in the initial round.

Issue 1.2-1: Should RAN extend the WI by a quarter to complete the remaining open issues?

- Proposals:
  - Option 1: Yes, extend TCD to March 2023.
  - Option 2: No, declare the WI complete.
- Recommended WF
  - Option 1.

Issue 1.2-2: GNSS aspect for UL transmit timing test

- Proposals:
  - Option 1: Include GNSS simulator/emulator to include UE GNSS implementation.
  - Option 2: Utilize simplified setup and bypass the UE GNSS implementation.
  - Option 3: Leave decision to RAN4.
- Recommended WF
  - TBA

Issue 1.2-3: Configuration of parameters related to the ephemeris of the satellite (SIB19 information)

- Proposals:
  - Option 1: Clearly define the reference configuration for ephemeris configuration for RRM tests in the test setups.

- Option 2: Leave the ephemeris configuration up to test equipment implementation.
- Option 3: Leave decision to RAN4.

- Recommended WF
  - TBA

Issue 1.2-4: Objectives for WI extension

- Proposals:
  - Option 1: Document the objectives of the extension in a formal WI exception request to include the outcome of Issues 1.2-2 and 1.2-3.
  - Option 2: Document the objectives of the extension in the status report to include the outcome of Issues 1.2-2 and 1.2-3.
  - Option 3: Others
  - Option 4: N/A. No WI extension.
- Recommended WF
  - TBA

1.2.2 Collection of company views

Issue 1.2-1: Should RAN extend the WI by a quarter to complete the remaining open issues?

Feedback Form 1: Issue 1.2-1: Should RAN extend the WI by a quarter to complete the remaining open issues?

1 – Nokia France We appreciate the Rapporteur's suggestion in RP-222739 to extend the WI by one quarter. We believe this should be sufficient to ensure that the remaining important aspects of the test configuration can be completed to ensure predictable NTN UE performance. Thank you.
2 – Nokia France (i.e. option 1, as recommended by the Moderator.)
3 – Qualcomm Incorporated Considering the fact that there are still key open items (as below), which are fairly new and no-precedent, we support the Recommended WF, i.e. Option 1. - Satellite information and constellation details - GNSS position acquisition methods - Where and How to model time-varying time/frequency drift rates and so on

4 – ZTE Corporation. Given the status of NTN UE RRM perf specification, we are fine with one quarter extension.
5 – Samsung Electronics Co. We are fine to either entend the WI performance with one quarter or continue the effort in maintenance phase.
6 – Inmarsat We agree with the extension of the performance part by 1 quarter, this will help also reducing the burden for IoT NTN.
7 – Ericsson France S.A.S We agree to extend the WI. Procedurally, since it is the performance part we wonder is it really necessary to make an extension request or isn't adding the open issues to the SR (and indicating <100% completion) sufficient ?
8 – Intel Corporation (UK) Ltd We are fine to either handle the remaining aspects in the maintenance stage or extend the performance part by one quarter
9 – MediaTek Inc. We are fine to handle it in the maintenance part or extend the work by 1 Q.
10 – Huawei Technologies Sweden AB Agree with Option 1 (extend TCD to March 2023.). Otherwise it would be against the SR.
11 – Eutelsat S.A. Agree with option 1.
12 – THALES We are open to either handle these remaing issues/clarifications as part of WI maintenance or extend the WI by one quarter to March 2023. Note that the SR in RP-222739 already reflects this extension request. Should an exception sheet be prepared ?

Issue 1.2-2: GNSS aspect for UL transmit timing test

Feedback Form 2: Issue 1.2-2: GNSS aspect for UL transmit timing test

1 – Nokia France Option 1 or option 3 would be good in our view.
2 – Apple Poland Sp. z.o.o.

We think it's an on-going technical discussion in RAN4 and option 3 is preferred.

3 – CATT

We support option 3 since it is under discussion in RAN4.

4 – Qualcomm Incorporated

The issue is under discussion in RAN4, hence, Option 3 should be okay.

5 – ZTE Corporation.

we support the option 3 to be discussed in RAN4 .

6 – Samsung Electronics Co.

We are fine to leave decision in RAN4. One question from our side, do we need to reslove this in RAN4 or we can leave it to RAN5 to decide how to consider GNSS aspect given it's more test centric issue other than RAN4 requirements centric issue.

7 – Inmarsat

We support Option 1. Option 2 would be a grave omission and Option 3 seems a waste of time since the decision was brought up to RAN - let's make a decision.

As a minimum, RAN4 should establish the requirement in terms of what is expected from GNSS to UE baseband.

8 – Ericsson France S.A.S

Option 3 would be fine with us; RAN gives RAN4 a mandate to discuss and agree. Option 1 would be OK too if there is a preference for some more RAN guidance.

9 – Intel Corporation (UK) Ltd

We prefer Option 3

10 – MediaTek Inc.

We are fine to have some discussion in RAN4, but if companies want to save some time (as commented by Inmarsat), we can also leave this decision to RAN5 which is the WG who really works on the detail of each approach.

11 – Huawei Technologies Sweden AB

Technical discussion was not concluded in RAN4. With WI extension we shall simply continue in RAN4, as per working procedures. Option 3.

12 – THALES

We don't believe that this is not a RAN level topic and therefore we would prefer option 3.

13 – Eutelsat S.A.

Option 3: The technical discussion should be allowed to conclude in RAN4.

Issue 1.2-3: Configuration of parameters related to the ephemeris of the satellite (SIB19 information)

Feedback Form 3: Issue 1.2-3: Configuration of parameters related to the ephemeris of the satellite (SIB19 information)

1 – Nokia France

Option 1 or option 3 would be good in our view.

2 – Apple Poland Sp. z.o.o.

Prefer option 3.

3 – CATT

Support option 3 since it is under discussion in RAN4.

4 – Qualcomm Incorporated

Support Option 3.

We believe the best is to define the reference satellite configurations in RRM spec, just like all of the existing configurations. On the other hand, the reference parameters and values may need more in-depth evaluation/verification taking into account testing procedures/frameworks in RAN5 based on TE vendors' and satellite companies' input. In any case, the detailed discussions and conclusions should be left to RAN4 first, and one of the outcomes can be a split of the work between RAN4 and RAN5 with a clear boundary between the responsibilities of RAN4 and RAN5.

5 – ZTE Corporation.

we support the option 3 similar as other companies.

6 – Samsung Electronics Co.

Option 3 fine for us. Also as commented in issue 1.2-2, do we need to adress this is RAN4 or leave it to RAN5 given it's more test centric issue?

7 – Inmarsat

Option 3 is ok, but it would be nice to avoid having to answer the same question in the next RAN Plenary. For us it's obvious that a reference configuration has to be considered to provide some guidance.

8 – Ericsson France S.A.S

Option 3 is fine

9 – Intel Corporation (UK) Ltd

We prefer Option 3

10 – MediaTek Inc.

We are not 100% sure what to be discussed in RAN4.

SIB19 is already defined in RAN2 specs. Moreover, in all test cases in 38.133, RAN4 usually cares only about the coderate of SIBx (e.g., the RMC of PDSCH which impacts the lowest decodable SNR) but never cares about how to interpret the physical meaning the individual bits in SIBx. In the past, this detail is always left for RAN5 implementation. We would like to understand more detail about what we expect RAN4 to discuss on this issue in the next quarter.

11 – Huawei Technologies Sweden AB

Technical discussion was not concluded in RAN4. With WI extension we shall simply continue in RAN4, as per working procedures. Option 3

12 – THALES

We prefer Option 3

13 – Eutelsat S.A.

Option 3 is preferred (give RAN4 time to conclude).

Issue 1.2-4: Objectives for WI extension

Feedback Form 4: Issue 1.2-4: Objectives for WI extension

1 – Nokia France

The Rapporteur has already summarized well the objectives for the extension in RP-222739, i.e.:

- Clarify the acquisition method of the GNSS position (GNSS simulation or test-loop fed position) for the transmit timing test. see WF (R4-2220711).
- Clarify configuration of NTN assistance information parameters (i.e. ephemeris, epoch time, validity duration) for the RRM tests.

2 – Apple Poland Sp. z.o.o.

Option 2 or 4. We don't need to revise the WID since all the remaining issues are the testing related and it's covered by the part of "Specify RRM test and network conformance tests [RAN4]" in WID.

3 – Qualcomm Incorporated

Option 1 or option 2.

We would also like to add the following to the objectives for the extension, which is one of the open items in RAN4 for several meeting cycles.

- Clarify where and how to model and factor in satellite-specific time-varying time/frequency drift rates and so on for the RRM tests.

4 – ZTE Corporation.

we also think that the current status report has clarified the remaining issue clearly.

5 – Samsung Electronics Co.

We think current Status report already clarified the status, no necessity to update the WID. Also exception sheet not really necessary for performant part extendsion given it's already reflected in the SR.

6 – Inmarsat

Current SR content is sufficient

7 – Ericsson France S.A.S

The SR seems sufficient

8 – Intel Corporation (UK) Ltd

Current SR is fine for us. The correct way to list the open issues for Perf part is to include them in the SR (i.e. exception sheet is not used for Performance part).

9 – MediaTek Inc.

SR is fine. The selection of the option may be up to the conclusion of previous issues.

10 – Huawei Technologies Sweden AB

We have well defined procedures for the WI extension. Therefore Option 2 shall be the common understanding. WI already captures related objectives.

11 – Eutelsat S.A.

Option 1 or 2 no strong preference.

12 – THALES

Option 2 is prefered. Already the SR clarifies the objectives of these extended period. If needed, option 1

The need to "clarify where and how to model and factor in satellite-specific time-varying time/frequency drift rates and so on for the RRM tests", may be discussed in RAN4

1.2.3 Summary and recommendation for further discussion

Thanks for the discussion in the initial round and for concluding on the issues presented on this topic. Please find the moderator summary and recommended way forward as follows.

https://nwm-trial.etsi.org/#/documents/8285

Issue 1.2-1: Should RAN extend the WI by a quarter to complete the remaining open issues?

- Recommended WF
  - Extend TCD to March 2023.

Issue 1.2-2: GNSS aspect for UL transmit timing test

The vast majority of companies indicated that the decision should be left to RAN4. No RAN action required.

- Recommended WF
  - Leave decision to RAN4. No RAN action required.

Issue 1.2-3: Configuration of parameters related to the ephemeris of the satellite (SIB19 information)

The vast majority of companies indicated that the decision should be left to RAN4. No RAN action required.

- Recommended WF
  - Leave decision to RAN4. No RAN action required.

Issue 1.2-4: Objectives for WI extension

The rapporteur has already captured a set of objectives for the WI extension in [2] which seems to reflect the necessary items based on company views. There was a request from Qualcomm to also add the following to the list of objectives; "Clarify where and how to model and factor in satellite-specific time-varying time/frequency drift rates and so on for the RRM tests." The rapporteur agreed that this can be further discussed in RAN4. In the moderator's view, this aspect is already covered by the WID description and implicitly by the second open issue for the performance part identified in the SR.

- Recommended WF
  - Status report in [2] captures the necessary set of objectives and TCD for the WI extension and can be noted.
  - WI extension for performance part is adequately captured in the SR. No WI exception request needed.

No additional rounds of discussion are necessary.

2 Topic #2: Status report for WI Perf. part: Solutions for NR to support non-terrestrial networks (NTN)

2.1 Proposed Objectives

Topic #2 will address any necessary updates for the Status report for WI Perf. part: Solutions for NR to support non-terrestrial networks (NTN) in [2].

2.2 Initial Round

The initial round will be focused on collecting company comments on the existing status report for WI Perf. part: Solutions for NR to support non-terrestrial networks (NTN). Companies are also requested to provide any suggested updates. Any necessary updates based on the outcome of the discussions in Topic #1 will be considered in the intermediate round.

2.2.1 Open Issues

The open issue for companies to consider in the initial round is identified in section 2.2.2.

2.2.2 Collection of company views

Issue 2.2-1: Other than Topic #1 aspects, are there any concerns with the status report?

Feedback Form 5: Issue 2.2-1: Other than Topic #1 aspects, are there any concerns with the status report?

2.2.3 Summary and recommendation for further discussion

There were no concerns with the status report identified in the initial round beyond the Topic #1 aspects. Given that Topic #1 can now be concluded, there are no revisions required for the status report in [2]. No additional rounds of discussion are necessary.

3 Final Conclusions

Moderator Way Forward:

- Extend TCD to March 2023
- Status report in [2] captures the necessary set of objectives and TCD for the WI extension and can be noted.
- WI extension for performance part is adequately captured in the SR. No WI exception request needed.

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Based on this way forward, the Moderator (RAN Vice-Chair, AT&T) recommendations for the documents provided are as follows:

1) RP-223368 [1] can be Noted.

2) RP-222739 [2] can be Noted.

4 References

[1] RP-223368: Discussion of progress of Rel-17 NR NTN performance work; Nokia, Nokia Shanghai Bell

[2] RP-222739: Status report for WI Perf. part: Solutions for NR to support non-terrestrial networks (NTN); rapporteur: Thales