**3GPP TSG RAN WG1 Meeting #109-E R1-22xxxxx**

**e-Meeting, May 9th – May 20th, 2022**

**Source: Moderator (Intel Corporation)**

**Title: FL summary #1 on TR 38.859 skeleton for Rel-18 SI on expanded and improved NR positioning**

**Agenda item: 9.5**

**Document for:** **Discussion and Decision**

# Introduction

This document is to collect feedback on the draft TR skeleton for TR 38.859 for Rel-18 SI on expanded and improved NR positioning [1].

[109-e-R18-Pos-01] Email discussion and approval of TR skeleton for Rel-18 SI on expanded and improved NR positioning by May 13 – Debdeep (Intel)

A draft TR skeleton has been provided in [2], and as part of this email discussion, companies are solicited to provide any feedback to the draft.

**For the first round of discussions, please provide your inputs latest by Wednesday, May 11th, 03:00 UTC.**

Please follow the naming convention in this example:

* *R18PosTRSkeleton\_FLS-v000.docx*
* *R18PosTRSkeleton\_FLS-v001-CompanyA.docx*
* *R18PosTRSkeleton\_FLS-v002-CompanyA-CompanyB.docx*
* *R18PosTRSkeleton\_FLS-v003-CompanyB-CompanyC.docx*

If needed, you may “lock” a spreadsheet file for 30 minutes by creating a checkout file, as in this example:

* Assume CompanyC wants to update *R18PosTRSkeleton\_FLS-v002-CompanyA-CompanyB.docx*.
* CompanyC uploads an empty file named *R18PosTRSkeleton\_FLS-v003-CompanyB-CompanyC.checkout*
* CompanyC checks that no one else has created a checkout file simultaneously, and if there is a collision, CompanyC tries to coordinate with the company who made the other checkout (see, e.g., contact list below).
* CompanyC then has 30 minutes to upload *R18PosTRSkeleton\_FLS-v003-CompanyB-CompanyC.docx*
* If no update is uploaded in 30 minutes, other companies can ignore the checkout file.
* Note that the file timestamps on the server are in UTC time.

To avoid excessive email load on the RAN1 email reflector, please note that there is NO need to send an info email to the reflector just to inform that you have uploaded a new version of this document. Companies are invited to enter the contact info in the table below.

## FL1 Question 1-1

* *Please consider entering contact info below for the points of contact for this email discussion:*

|  |  |  |
| --- | --- | --- |
| **Company** | **Point of contact** | **Email address** |
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# Initial round

## FL1 Question 2-1

* *Companies are invited to provide feedback on the draft TR skeleton available in* [R1-2204804](https://www.3gpp.org/ftp/TSG_RAN/WG1_RL1/TSGR1_109-e/Docs/R1-2204804.zip) [2].

|  |  |
| --- | --- |
| **Company** | **Comments** |
| **vivo** | **1. Current section 5.1 captured some text of requirements for sidelink from SID. However, given on-going RAN1 discussion on the “**specific target performance requirements to be considered for the evaluation” of sidelink positioning, we suggest to put them into bracket or to add note clarifying that this part can be updated with RAN1 agreements on sidelink scenarios/requirements.  **2. It’s not clear to us where to capture potential specification impact for the identified solutions in general. In the same section of potential solutions? We prefer to have one section to describe solution and another section to describe associated specification impact. Especially for sidelink, we think section 5.2 may capture descriptions regarding positioning methods as solution (strictly speaking, they are not just physical layer solutions). We suggest adding another section for capturing physical layer aspects.**  **3. There’s Annex E for evaluations for LPHAP, but no sub-section of 6.4 to summarize it.** |
| CMCC | Regarding Section 6.4, we suggest to add the following three subsections:  6.4.1 Target Use Case and Requirement  6.4.2 Evaluation Methodologies and Power Consumption Models  6.4.3 Summary of Evaluations for LPHAP |
| NEC | **Comment 1**: Evaluation methodology of sidelink positioning can be moved back to the main section 5.1 instead of in appendix, where mainly simulation results are presented.  **Comment 2**: We suggest to divide section 5.1 into following sub-sections  5.1.1 Target requirement (this subsection discusses target requirements and performance metrics)  5.1.2 Use cases and scenarios (this subsection discusses use case, coverage scenarios and spectrum)  **Comment 3**: Agree with vivo that a section for specification impacts should be a section for specification impacts before the conclusion section.  **Comment 4**: For section 6.5, maybe there is no need to have subsection for potential solutions at the moment since the necessity of enhancements needs to be assessed before we decide to do many enhancements. |
| Ericsson | Agree with CMCC’s suggestion for subsection in 6.4.  For evaluations of items under section 6, we should also document the evaluation assumption. One possibility is to make appendix A common for all evaluation assumation and use A.1 for sidelink positioning, A.2 for PRS/SRS aggregation, A.3 for carrier phase, A.4 for LPHAP, A.5 for RedCap. |
| Qualcomm | **Comment 1:** We think the expression “physical layer” is not needed in 5. 2  5.2 Potential ~~Physical Layer~~ Solutions for Sidelink Positioning Comment 2: With regards to 5.4, we think, following the current SID, there is an explicit request to evaluate the bandwidth requirements to meet the identified accuracy requirements. This evaluation should have its own subsection.5.4 Summary of Sidelink Positioning Evaluations 5.4.1 Bandwidth Requirements Needed to meet the identified accuracy requirements  5.4.2 Evaluation of Absolute Positioning, Relative Positioning, and Ranging Methods |
| Lenovo | Current Sec. 6 title, may possibly be a bit confusing/ambiguous with respect to the applicability and scope of the enhancements to current positioning methods: DL-based, UL-based and (UL and DL) positioning. Suggest a clarification, e.g., “Downlink and Uplink (Uu) Positioning”.  Also share CMCC’s views on additional sub-sections (6.4.1/6.4.2/6.4.3) for LPHAP |
| CATT | **Comment 1:**  For the heading of Section 6.3.1, we assume it will contain various potential solutions for the NR carrier phase positioning. The carrier phase measurements will be used for supporting NR carrier phase positioning, and potentia solutions may be based on various techniques. Thus, we suggest the following modification:  6.3.1 Potential Solutions for ~~Based on~~ NR Carrier Phase Positioning ~~Measurements~~  **Comment 2:**  For the heading of Section 6.3.2, we suggest the following changes: 6.3.2 Summary of Evaluations ~~Based on~~ for Carrier Phase Positioning ~~Measurements~~ |
| Samsung | We suggest to change the title of section 6 (Downlink and Uplink positioning 🡪 Positioning enhancement) since some of features in section 6 can be applied for sidelink also. Other suggestion would be O.K for the title if it does not limit into DL and UL.  We suggest to add Annex for ‘Evaluation Methodology for Carrier Phase Measurements’ because we need to define a model for carrier phase measurement considering measurement errors and impairments. |
| Xiaomi | 1. In section 5.1, A separate sub-section would be needed to capture the identified service requirement of sidelink positioning; 2. For section 5.2, many positioning methods are not just PHY solutions; we suggest to use different sections to capture potential positioning methods and potential physical layer impacts. |
| InterDigital | In Annex, we propose to add a dedicated annex “Evaluation Results for Integrity for RAT-Dependent Positioning Techniques”. As discussed in [109-e-R18-Pos-05], error modeling may require evaluations of distributions of an error source. Thus, dedicated annex can be used for demonstrating evaluation results. Similarly, we would like to propose to add a subsection “Summary of Evaluation Results for Integrity for RAT-Dependent Positioning Techniques” in 6.1. |
| Nokia/NSB | * For Section 6.3 (and relevant changes to sub-sections/Annex D) we suggest changing the title slightly to NR Carrier Phase Positioning ~~Measurements~~. To make it clear we are talking about NR based carrier phase for outside readers. * For some topics (e.g., LPHAP) we may need to define new evaluations methodologies. Is the plan to add those sub-sections to Section 6 (as CMCC suggests) or to add a new Annex for each new methodology? Suggest to take a common approach for all topics.   Clause 4: typo “uses cases” |
| Huawei, HiSilicon | 1. For SL, we should have a separate sub-section for SL positioning evaluation methodology. 2. For LPHAP, we suggest having the following sections structure based on the SID   6.4 Low Power High Accuracy Positioning  6.4.1 Use cases and requirements  6.4.2 Potential solutions for LPHAP  6.4.3 Summary of Evaluations for LPHAP  3. It would be better to add a sub-clause to figure out the potential spec impact. |

# References

1. RP-213588, Revised SID on Study on expanded and improved NR positioning, Intel (Email discussion moderator), RAN #94-e.
2. R1-2204804, “Draft skeleton of TR38.859,” Intel Corporation.