**3GPP TSG RAN WG1 Meeting #111 R1-22xxxxx**

**Toulouse, France, November 14th – 18th, 2022**

**Source: Intel Corporation (Moderator)**

**Title: Post-meeting Comments to Draft TR 38.859 v030: Study on expanded and improved NR positioning**

**Agenda item: 9.5**

**Document for: Discussion**

# Introduction

This document summarizes the following RAN1 email discussion:

[Post-111-Positioning\_TR] Email discussion for endorsement of TR38.859 update according to the agreements at RAN1#111 – Debdeep (Intel)

* From Nov 28 until Nov 29

A draft for TR 38.859: Study on expanded and improved NR positioning, incorporating decisions until end of RAN1 #111 meeting, is presented.

This document is used to collect any feedback to the draft TR shared in the folder [\TR38.859\DRAFT\_TR](https://www.3gpp.org/ftp/tsg_ran/WG1_RL1/TSGR1_111/Inbox/drafts/9.5%28FS_NR_pos_enh2%29/TR38.859/DRAFT_TR) and its subsequent revisions.

Please follow the naming convention in this example:

* *CommentsToDraftTR38859v030-v000.docx*
* *CommentsToDraftTR38859v030-v001-CompanyA.docx*
* *CommentsToDraftTR38859v030-v002-CompanyA-CompanyB.docx*
* *CommentsToDraftTR38859v030-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 *CommentsToDraftTR38859v030-v002-CompanyA-CompanyB.docx*.
* CompanyC uploads an empty file named *CommentsToDraftTR38859v030-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.
* CompanyC then has 30 minutes to upload *CommentsToDraftTR38859v030-v003-CompanyB-CompanyC.docx*
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# Company views

Please provide any feedback to the latest version of the draft TR below.

|  |  |
| --- | --- |
| Company | Comments |
| Huawei, HiSilicon | **Section 2:**Reference [54] can be avoided, which is updated in [111]. Please also replace the observations derived from [54] to [111].**Section 2:**References [54] to [72] have wrong format. The comma should be removed, and the SPACE between t-doc number and t-doc title should be replaced with TAB.

|  |
| --- |
| R1-2208652, Discussion on positioning for RedCap UEs, vivo ==>R1-2208652 Discussion on positioning for RedCap UEs, vivo |

**Section 6.4.3:**Under the case of source [92], “Cell access procedures per 10.24s;” should be removed from row 4.**Section 6.4.4:**This section seems a little incomplete. It merged inputs from RAN1/RAN2 on SRS validity area, but other recommendations from RAN2 are missing.**Sections 6.4.2.2 and 7.6:**Multiple instances of R1/R2 should be better revised to RAN1/RAN2.**Section 7:**We prefer to change recommendation to conclusion, because this section not only summarizes the recommendation, also requirements and use cases (e.g. LPHAP).

|  |
| --- |
| Based on the studies conducted in RAN working groups, the following recommendations are made. |

**Section 7:**We think that a subsection summarizing the use cases and requirements of SL positioning/ranging should be captured in the conclusion, e.g. the table as shown in Table 5.1-1.**Section A.3:**In the row of UE/TRP antenna phase center offset (PCO), we think that the explanation to Example 1 and Example 2 in the NOTE should be swapped. Maybe Ren can also check it.**Section X (Change history):**RAN3#118 should be added as well to the meetings list. |
| CMCC | 1. Regarding bullets b, d under Section 6.4.2.2 Higher layer aspects, as they were agreements made by RAN2 and were explicitly mentioned “is/are recommended for normative work”, I was wondering whether they should be moved to Section 6.4.4 Potential specification impact?2. The following agreement made in RAN1 seems to be forgotten:**Agreement**For the conclusion section of the TR:* Enhancements on simplified DL PRS configuration with 1-symbol PRS can be studied further and if needed, specified during normative phase.

3. Regarding the following agreement, as the note clearly says no RAN1 specification impact has been identified, I’m not sure whether it should be captured in Section 6.4.4 Specification impact?**Agreement**Extending DRX cycle beyond 10.24s was studied and found beneficial towards meeting the battery life requirement for LPHAP, and is recommended for normative work on Rel-18 positioning enhancements from RAN1’s perspective. * Note: no RAN1 specification impact has been identified
 |
| ZTE | Thanks for Debdeep’s great effort, please find our comments and revisions (marked in red) as follows.**For DRAFT 3GPP\_TR\_38.859\_v0.3.0\_main****Section 5.1**The reference index number of TS 22.104 is not correct.  TS 22.104 ~~[5]~~ [6]**Section 5.2.1**Typos, we noticed that SL-PRS was replaced by SL PRSSL PRS in multiple places.**Section 5.3.1**We found several typos.(1)For V2X use case in highway scenario, 14 sources ([19], [20], [21], [22], [23], [24], [26], [27], [29], [30], [31], [32], [33], [78]) provided simulation results for FR1, and 2 sources ([27], [32]) provided simulation results for FR2. * For absolute horizontal accuracy, the results were provided by 14 sources. 12 out of 14 sources show that, the target requirement Set A can be achieved, and 9 out of ~~13~~14 sources show that the target requirement Set B cannot be achievable even with 100MHz.

(2)* For distance accuracy of ranging, the results were provided by 12 out of 14 sources. 7 out of 12 sources show that the target requirement Set A can be achievable by 20MHz, and 7 out of 12 sources show that the target requirement Set B cannot be achieved with 100MHz bandwidth.

(3)* For angle accuracy of ranging, the results were provided by 6 out of 11 sources. 5 out of 6 sources show that the target requirement Set A can be achieved with 20MHz or 40MHz, and 4 out of 6 sources show that the target requirement Set B cannot be achieved with 100MHz.

(4)* For distance accuracy of ranging, the results were provided by 5 out of 9 sources. 4 out of 5 sources show that the target requirement Set A can be achievable by 100MHz, and 3 out of 5 sources show that the target requirement Set B cannot be achieved with 100MHz bandwidth.

(5)For IIOT use case in InF-DH scenario, 7 sources ([18], [19], [20], [24], [28], [30], [32]) provided simulation results for FR1, and 1 source ([32]) provide~~s~~d simulation results for FR2.**Section 5.3.2*** For Public safety, 1 source ([24]) shows performance improvement of Joint Uu-SL absolute positioning compared to SL-only or Uu-only positioning.
* For commercial use case, 1 source ([24]) shows performance improvement of Joint Uu-SL absolute positioning compared to SL-only positioning.

**Section 6.3.2**The value range of N is ±1 and align with others in the TR.* Source [85]) shows
* When multiple subcarriers with in one PFL are used:
* For InF-SH scenario with other errors (initial phase on both TRP and UE sides)
	+ DL-CPP accuracy (Case 1-2-9, N is limited to ~~+~~±1): 0.12 m@50% and 0.25m @80%.

**Section 6.4**The following agreement was achieved in the RAN1#111. However, it is weird that this agreement is not mentioned anywhere in section 6.4.x of TR 38.859, even not mentioned “6.4.2 Potential Enhancements for Low Power High Accuracy Positioning”, but come out in the conclusion for LPHAP in Section 7.6.We prefer to include the following agreement in Section 6.4.**Agreement**For the conclusion section of the TR:* Enhancements on simplified DL PRS configuration with 1-symbol PRS can be studied further and if needed, specified during normative phase.

**For DRAFT 3GPP\_TR\_38.859\_v0.3.0\_AnnexB6\_X**There is a blank column in Table B.6.7.2-1, which is recommended to be deleted. |
| vivo | 1. for RTT-type, we prefer to remove ‘either’, and change “or ” to “and“ if both are removed.
* RTT-type solutions using SL
* This includes ~~either~~ single-sided (also known as one-way) RTT ~~or~~ and double-sided (also known as two-way) RTT
1. A typo(duplicate “SL-PRS”) appears multiple times in section 5.2.1, 5.2.2 and 7.2, for example

With regards to the Positioning methods supported using SL PRSSL PRS measurements at least the following measurements are agreed to be introduced:  |