**3GPP TSG RAN WG1 #113 R1-23XXXXX**

**Incheon, Korea, May 22nd – May 26th, 2023**

**Source: Moderator (Xiaomi)**

**Title:** **Moderator summary on discussion of SA2 LS in R1-2304306 on SL positioning procedure**

**Agenda item: 9.5.1**

**Document for:** **Discussion**

# Introduction

This document is the summary of comments on drafting RAN1 reply LS on incoming SA2 LS in R1-2304306 [1] on SL positioning procedure.

# Background

In [1], SA2 requests RAN1 and RAN2 to provide feedback on the feasibility of specifying relative velocity in Rel-18, and welcome feedbacks on other results defined.

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| --- |
| ……  With reference to attached S2-2305750, SA2 has the following question for RAN1 and RAN2:  Question 2: SA2 discussed whether or not relative velocity in the S2-2305750 would be feasible to specify in Rel-18, and would like to see if RAN2 and RAN1 has any feedback. SA2 would also welcome feedbacks on other results defined in S2-2305750.  ……  **To RAN2, RAN1**  **ACTION:** Take SA2 answers into consideration and provide feedbacks to SA2 on the SA2 further questions.  …… |

# 1st round discussion

There are 7 companies providing their views on the reply LS draft [2-11].

*On feasibility of specifying relative velocity in R18*

3 companies [2, 5, 7, 8] think RAN1 shall reply that relative velocity is feasible to specify in Rel-18. 1 company [3,4] thinks that t is up to RAN2 or SA2 to decide whether or not relative velocity is feasible to specify in Rel-18. 1 company [9,10] does not think it is feasible to specify relative velocity support in Rel-18, and 1 company [11] thinks only radial component of relative velocity is feasible to specify.

The concern from [9.10] on the feasibility seems mainly on the workload in RAN1. Further, 3 companies [3,4,6,9,10] has mentioned that RAN1 has not studied or evaluated relative velocity. Therefore, maybe a potential compromise way forward is to agree that it is feasible to specify relative velocity in Rel-18, but further clarify that RAN1 has not studied or evaluated relative velocity, and there is no RAN1 specification impact if relative velocity is specified.

On radial and traverse components of relative velocity, from moderator’s understanding, both radial and traverse components can be obtained if both distance and direction are estimated by ranging. The relative position change over time can be used to estimate both components of the relative velocity. As this issue is only proposed in [11], the moderator would welcome other companies to provide their views on this (in the comments of Q1).

The moderator would like to check whether the following proposal can be accepted.

**Q1: Can you accept the following reply to SA2:**

**“From RAN1 perspective, it is feasible to specify relative velocity in Rel-18. However, RAN1 has not studied or evaluated relative velocity, and assumes that there is no RAN1 specification impact if the relative velocity is specified in Rel-18.”**

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| --- | --- | --- |
| Company | Yes/No | Comments |
| OPPO | Yes |  |
|  |  |  |
|  |  |  |

On comment from [11] that the relative speed can also be represented using 2D (bearing + horizontal speed) or 3D (bearing + horizontal speed + vertical speed), the moderator thinks this may not be directly related to SA2 request.

*On other resutls*

2 companies [5] [7,8] think that RAN1 does not need to provide feedback on other results, while 1 company [11] suggests to request SA2 to further check whether TS 23.032 should be updated so the direction can be represented using a referenced coordinate system.

The moderator would like to further check the majority views on this.

**Q2: Do you think RAN1 shall**

**Alt 1: provide no feedback on other results defined in S2-2305750.**

**Alt 2: request SA2 to further check whether TS 23.032 should be updated so the direction can be represented using a referenced coordinate system?**

|  |  |  |
| --- | --- | --- |
| Company | Alt 1/2 | Comments |
| OPPO | Alt 1 |  |
|  |  |  |
|  |  |  |

# Companies view

Some companies have provided their views in contributions, which are summarized as below:

|  |  |
| --- | --- |
| Source | Views |
| [2] | **Answer**: In RAN1’s view, parameters defined in RAN2’s QoS parameters include ‘velocityRequest’ for absolute & relative positioning and ‘velocityRequest’ for ranging as in LS R2-2302255. In the RAN1 112bis meeting, RAN1 confirm that RAN2’s understanding of those SL positioning QoS parameters is correct. And further clarify that for relative positioning and ranging, the ‘velocityRequest’ is considering only the relative velocity. In our view, the relative velocity is feasible to specify in Rel-18. |
| [3,4] | **Proposal 1: Regarding the issue of relative velocity in the SA2 reply LS** **R1-2304306(S2-2305735), suggest providing the following response:**   * **From RAN1 perspective, RAN1 has not studied or specified the relative velocity. It is up to RAN2 or SA2 to decide whether or not relative velocity in the S2-2305750 would be feasible to specify in Rel-18.**   Regarding the issue of relative velocity in the SA2 reply LS R1-2304306(S2-2305735), suggest providing the following response:   * From RAN1 perspective, RAN1 has not studied or specified the relative velocity. It is up to RAN2 or SA2 to decide whether or not relative velocity in the S2-2305750 would be feasible to specify in Rel-18. |
| [5] | RAN1 Reply: RAN1 thinks relative velocity is feasible to specify in Rel-18. And RAN1 does not identify any issues on other results defined in S2-2305750. |
| [6] | RAN1 has not evaluated the performance of relative velocity for relative positioning or ranging. RAN1 assumes that no specific solution is needed to handle the relative velocity determination for SL relative positioning or ranging. |
| [7,8] | *Proposed reply:*   * ***From RAN1 perspective relative velocity is feasible to be specified in Rel-18, relative velocity can be derived based on relative location estimated at different times by LMF or UE. RAN1 has no feedback to the other results defined in S2-2305750.*** |
| [9,10] | **Observation 1 Relative velocity was not studied during the SI phase of rel18 positioning.**  **Observation 2 The scope of WI and RAN1’s workload is already very large.**  **Proposal 1 RAN1 should not specify support for relative velocity in Rel-18.**  Considering the fact that no study was done on relative velocity in RAN groups, and the high workload in RAN1, RAN1 does not think it is feasible to specify relative velocity support in Rel-18. Additionally, RAN1 does not foresee any RAN1 impact in specifying relative velocity in RAN1 specifications. |
| [11] | ***Observation 1: The decomposition in relative velocity into radial axis and transverse axis should target the scenario when only the radial speed is expected.***  ***Proposal 1: Obtaining the radial relative speed is feasible from RAN1 perspective.***  ***Proposal 2: Besides using radial speed, the relative speed can also be represented using 2D (bearing + horizontal speed) or 3D (bearing + horizontal speed + vertical speed).***  ***Proposal 3: For other location results, the direction can also be represented using a referenced coordinate system. SA2 may further check whether TS 23.032 should be updated to incorporate it.***  ***Proposal 4: Adopt the draft reply LS in the Appendix.***  Answer 2:  On relative velocity  Obtaining the radial relative speed is feasible from RAN1 perspective.  Besides using radial speed, the relative speed can also be represented using 2D (bearing + horizontal speed) or 3D (bearing + horizontal speed + vertical speed).  On other results  The direction can also be represented using a referenced coordinate system. RAN1 respectfully requests SA2 to further check whether TS 23.032 should be updated to incorporate it. |

# Summary and conclusion

TBD

Reference

1. R1-2304306 Reply LS to LS to SA2 on Sidelink positioning procedure SA2, Xiaomi
2. R1-2304448 Draft reply LS to SA on Sidelink positioning procedure vivo
3. R1-2304692 Discussion on Sidelink positioning procedure CATT
4. R1-2304693 Draft reply LS on Sidelink positioning procedure CATT
5. R1-2304924 Draft Reply LS on Sidelink positioning procedure ZTE
6. R1-2305025 Draft Reply LS on Sidelink positioning procedure xiaomi
7. R1-2305425 Discussion on the LS from SA2 on Sidelink positioning procedure OPPO
8. R1-2305426 Draft reply LS to SA2 on Sidelink positioning procedure OPPO
9. R1-2305890 Discussion on reply LS to LS to SA2 on Sidelink positioning procedure Ericsson
10. R1-2305891 Draft Reply LS to SA2 on Sidelink positioning procedure Ericsson
11. R1-2305939 Discussion on SL positioning procedures Huawei, HiSilicon