3GPP TSG-RAN WG2 Meeting #124***R2-23xxxxx***

Chicago, IL, US, November 13 – 17, 2023

**Agenda item:** 7.2.1

**Source:** Qualcomm Incorporated

**Title:** Summary of [Post124][413][POS] Rel-18 positioning 38.305 CR (Qualcomm)

**Document for:**  Discussion and Decision

# 1. Introduction

This document summarizes the following email discussion:

* [Post124][413][POS] Rel-18 positioning 38.305 CR (Qualcomm)

 Scope: Finalise and check the Rel-18 positioning 38.305 CR.

 Intended outcome: Agreed CR

 Deadline: Short (for RP)

The Stage 2 from RAN2#124 (R2-2312786) has been updated (version \_v07; changes were made as Word User "\_v07"):

- Alignments with latest Stage 3 CRs:

- Addition of sections 8.12.3.1.2.1a and 8.12.3.1.2.2a

- Additions of sections 8.15 (and sub-sections)

# 2. Comments on \_v07 of the running CR

Companies are invited to provide their comments on the current version (\_v07) of the 38.305 CR in the table below.

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| --- | --- | --- | --- |
| Company | Section (in \_v07) | Comments | Rapporteur Comments |
| CEWiT | 7.12 | Since multiple UE roles are agreed to be indicated in the discovery metafield, the SL server UE discovery and selection can be performed in step 2 itself if UE1 does not support SL Server UE functionality.The following figure shall be considered. | It seems there were multiple CRs agreed at SA2#160.The signalling between UE and SL Server UE seems not SLPP directly, but "supplementary RSPP signalling" (which seems will be SS 24.080), but up to CT4.A LS has been sent to RAN2 in S2-2313889, incl. agreed CRs.I updated this section according to S2-2313890 (which is attached to the LS in S2-2313889) in \_v08. |
| Huawei, HiSilicon | 4.3.16.3 Sidelink Time Difference of Arrival (SL-TDOA) | SL-RSTD measurements between a target UE and multiple peer UEs can be used to determine the location of the target UE relative to the locations of the peer UEs (e.g., anchor UEs).For SL-TDOA, is it only applicable for absolute positioning? If so, it is not clear here it says the location of the target UE relative to the location of the peer UEs.The same question also applies for SL-TOA  | Location determination for TDOA/TOA is always relative to the location of the "anchors" (similar to Uu). Only if the absolute location of the anchor's is known, target UE location will also be absolute.  |
| Huawei, HiSilicon | 4.3.1 Introduction | Perhaps it would also be beneficial to clarify the mapping between different SL positioning methods and relative location/absolute location/range and direction/velocityTable 4.3.1-2: Supported versions of SL positioning and ranging methods.

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| --- | --- | --- |
| Method | SL-Target UE-based | SL-Target UE-assisted, server-based |
| SL-RTT | Yes | Yes |
| SL-AoA | Yes | Yes |
| SL-TDOA | Yes | Yes |
| SL-TOA | Yes | Yes |

 | I understand any positioning method can be used for relative and absolute location (depends on location knowledge of the anchors). Also, any positioning method can in principle be used to obtain velocity (in its simplest form, by performing 2 location estimates and dividing the result by the time in between).I added a Note to the Table regarding range and direction in \_v08. |
| Huawei, HiSilicon | 6.2.5 Sidelink Positioning Protocol (SLPP) | SLPP session id is only applicable for the case when an SLPP session is terminated between two UEs?An SLPP Session is used between UEs or between a UE and an LMF to fulfil a ranging/sidelink positioning service request. A SLPP Session comprises one or more SLPP transactions. A UE may simultaneously participate in multiple SLPP sessions. A SLPP Session ID is used to identify all SLPP transactions belonging to an SLPP session. The SLPP Session ID enables SLPP endpoints to uniquely distinguish SLPP messages for one session from SLPP messages for other sessions. | Yes, it seems so (although, no hard decision):Agreements:Close the open issue 5 and 6 on Session handling for LMF involved case:- session ID is OPTIONAL in the SLPP message for the communication between target UE and the LMF;- Session ID is assigned by target UE and used for communications between UEs.Updated this paragraph and added a NOTE accordingly in \_v08. |
| Huawei, HiSilicon | 7.3 Service Layer Support using combined LPP and NRPPa Procedures | Editror’s NOTE needs to be removed after this versionEditor's Note: FFS whether the below sections require updates for sidelink positioning. Will be updated later, depended on SA2 progress.SA2 seems to have made some progress in this meeting? | I haven't seen changes on the legacy 5GC procedures (yet). However, I updated the SL procedures in 7.3A according to S2-2313889 (LS), S2-2313706 (SL-MT-LR), S2-2313891 (SL-MO-LR).Editor's Note removed. |
| Huawei, HiSilicon | 7.6.2 On-Demand PRS transmission procedures | It has also been agreed in the last meeting that CA positioning can be supported for on-demand PRS request | Added a NOTE 7 in \_v08 accordingly. |
| Huawei, HiSilicon | 7.3A.1 General | Editror’s NOTE needs to be removed after this versionEditor's Note: The below sub-clauses may need further alignment/confirmation with e.g., SA2 23.273. | Removed. Updated the section as mentioned above. |
| Huawei, HiSilicon | 7.12 General UE-only sidelink positioning and ranging procedure | Based on the endorsed TP in SA2, the signlaing between target UE and SL server UE seems to be based on SS message, although it is not completely clear to me what does it mean by SS SLPP message. Ref S2-2313889* **SA2 Agreement 5:** Message from Target UE to Located UE to request Located UE’s absolute location, i.e. step 17 of 6.20.1 in TS 23.273 (CR 0416 of TS 23.273) is transferred as Supplementary RSPP signalling message over SR5

Editor’s NOTE should also be removed | Indeed…Updated this section according to S2-2313890 (attached to the LS in S2-2313889).Editor's Note removed. |
| Huawei, HiSilicon | 8.12.3.1.2.1a LMF initiated Periodic Assistance Data Delivery | Have we agreed on periodic assistance data delivery for DL-TDOA? Although I understand that this is to mimick the RTK-like periodic AD delivery | It was included in the RAN1 response LS in R2-2313897:Answer for Q8) The LMF can forward the carrier phase measurements together with the legacy measurement associated with the carrier phase measurement. - Note1: there is no consensus in RAN1 that the LMF can forward UE Rx-Tx time difference measurement.- Note2: carrier phase measurements include both RSCP and RSCPDBoth one time (aperiodic) and periodic provision of PRU carrier phase measurements should be supported, which could be requested by the UE. |
| Huawei, HiSilicon | 8.15.1 SL-PRS transmission and reception | The wording in the previous RAN1 agreement is SL-PRS dedicated/shared resource poolA sidelink resource pool which can be used for transmission of both, SL-PRS and SL data is referred to as shared resource pool. A sidelink resource pool which can be used for transmission of SL-PRS and cannot be used for transmission of SL data is referred to as dedicated SL-PRS resource pool.  | Updated accordingly. |
|  | 8.15.2.1 General | For SL-RTT, the pair of UEs may transmit and receive SL-PRS once (also referred to as "single-sided RTT") or multiple times (also referred to as "double-sided RTT"). A UE may report multiple SL Rx-Tx time difference measurements for the same SL-PRS transmission and up to 4 different SL-PRS receptions, or report multiple SL Rx-Tx time difference measurements for the same SL-PRS reception and up to 4 different SL-PRS transmissions, or both.The highlighted part above does not seem to be quite clear. How can a UE report measurements for a SL-PRS it transmits? | Copied from RAN1 agreement/SLPP:"UE can be requested to either: - report multiple Rx-Tx measurements for the same SL PRS transmission and up to N different SL PRS receptions, or- report multiple Rx-Tx measurements for the same SL PRS reception and up to N different SL PRS transmissions, or both"For RxTx, the UE need to transmit and receive (each single or multiple times).  |
| InterDigital | 8.12.3.1.2.2a | 1. “UE initiated Periodic Assistance Data Transfer” : Since the request can include both periodic and aperiodic, thus the title should be changed to “UE initiated Assistance Data Transfer.” Same comment is applied for the title of the figure in the subclause.2. In Step (1), “This request includes an indication of which specific assistance data are requested together with additional information such as desired periodicity for sending the assistance data and a duration for ending the periodic assistance data delivery session.” We are not sure if this fully captures aperiodic data transfer agreed in R1-2312434. Suggseted change is the following “This request includes an indication of which specific assistance data are requested together with additional information such as desired periodicity, including aperiodic transfer, for sending the assistance data and a duration for ending the periodic assistance data delivery session.”3. Should “which specific assistance data are requested” in Step (1) be an open issue? We did not have time to discuss the details of the content that the UE can request. | Aperiodic procedure is the existing procedure in 8.12.3.1.2.1 and 8.12.3.1.2.2.The periodic procedures are according to LPP sections 5.2.1a and 5.2.2a (existing LPP functionality).See also GNSS sections in Stage 2 and/or LPP.The only periodic assistance data are the PRU measurements, according to RAN1 LS. |
| InterDigital | 8.15.1 | 1. WordingInclude the term “NR” in the “over the NR PC5 interface” in the first paragraph.“the UE autonomously selects…” -> “The UE autonomously selects….” In the last sentence.2. Include coverage information for clear understanding in the second parapraph:A UE can be configured with one or more sidelink resource pools via system information or dedicated signalling while inside NG-RAN coverage or by pre-configuration while outside NG-RAN coverage as specified in TS 38.331 [14]. The description is referred by stage 2 (38.300, section 16.9.3.3) | 1. Updated in \_v08.After a semicolon, the sentence should continue with lower case letter.2. Updated in \_v08. |
| InterDigital | 4.3.16.14.3.16.24.3.16.34.3.16.4 | Wording (adding hyphen)“SL PRS-RSRP”, ->“SL**-**PRS-RSRP”“SL PRS-RSRPP” -> “SL**-**PRS-RSRPP” | Updated in \_v08. |
| ZTE | 8.15.1  | Issue 1First green should be ‘SL-PRS resource allocation’, second green should be ‘SL-PRS transmission resources’Two sidelink resource allocation schemes for SL-PRS are supported: scheme 1 and scheme 2. In scheme 1, the sidelink resource allocation is provided by the network. In scheme 2, the UE decides the SL transmission resources in the resource pool(s). | Updated in \_v08a |
| ZTE | 8.15.3.1  | Issue 2SL-AoA should be only anchor UE to receive and measure. RAN1 does not agree SL-AoD method(which is target UE to measure angle measurement)The SL-AoA positioning method makes use of SL angle of arrival measurements performed by a UE (e.g., target UE or anchor UE).  | I've checked – but I have not found such a RAN1 agreement. Of course, SL-AoD is not supported, but this is a different issue (in AoD, the measurements are power, which are used to determine angles). For SL-AoA, there is e.g.:"Agreement:For provision of assistance information for SL AoA measurement, expected SL-AoA value and uncertainty range can be provided to measuring UE.No specification impact on how to set the uncertainty rangeFrom RAN1 perspective, no performance requirements are expected to be defined for the uncertainty range in Rel-18The SL AoA is determined at the receiving UE’s antenna(s) for a SL channel corresponding to the transmitting UE."RAN1 does not use the (confusing) UE-roles. There is only a Tx and Rx UE above. The AoA is measured by a "measuring UE". How else would you obtain e.g., direction between two UEs? |
| CATT |  | The CR R3-238097 was endorsed by RAN3 on SRS configuration with validity area. I’m not sure when will it be merged into stage-2 CR by RAN2. | I understand when approved by RAN3. However, RAN3 has not agreed any CRs yet (only endorsed baseline CRs). The WI is extended:The Rel-18 Positioning WI extends to next quarter, pls rapporteur provide SR report and WID extension to RAN#102. |
| CATT | 3.1 | **Ranging/SL Positioning Protocol (RSPP):** RSPP comprises SLPP messages and Supplementary Services messages according to TS 23.586 [46].Do we need to put the definition of SLPP in the clause as well?  | I suggest keeping this for now, since I used the SA2 "Supplementary RSPP" terminology in the procedures (e.g., 7.12). We can update when we know the Stage 3 message names.(It is actually also not quite clear to me why this is needed. ) |
| CATT |  | Please don't forget deleting the change on change parts. E.g. 8.12.3.1.3.1 LMF-initiated Location Information Transfer Procedure | There are none in this version? |
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# 3. Summary of Open Issues

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|  | Section | Issue  | Way Forward |
| 1 | 7.3 Service Layer Support using combined LPP and NRPPa Procedures | Editor's Note: FFS whether the below sections require updates for sidelink positioning .Will be updated later, depended on SA2 progress. | Furter updates will be handled in the maintenace phase and/or company contributions, dependent on SA2 progress. |
| ~~2~~ | ~~7.3A Service Layer Support for Sidelink Positioning~~ | ~~Editor's Note: The below sub-clauses may need further alignment/confirmation with e.g., SA2 23.273.~~ | ~~Furter updates will be handled in the maintenace phase and/or company contributions, dependent on SA2 progress.~~ |
| ~~3~~ | ~~7.12 General UE-only sidelink positioning and ranging procedure~~ | ~~Editor's Note: The above is a transcript of clause 6.8 in TS 23.586. However, there may be some concerns with this general procedure (as discussed in multiple contributions to previous RAN2 meetings), e.g., with steps 2 or 3 which probably should include also the SL Server UE, etc. Therefore, the above is FFS.~~ | ~~Furter updates will be handled in the maintenace phase and/or company contributions, dependent on SA2 progress.~~ |
| ~~4~~ | ~~8.10.3.1.3.1~~~~8.12.3.1.3.1~~ | ~~Editor's Note: FFS which Multi-RTT measurements are performed within the time windows.~~~~Editor's Note: FFS which DL-TDOA measurements are performed within the time windows.~~ | ~~Will be updated later, based on LPP progress.~~ |
| ~~5~~ | ~~8.15 SL positioning and ranging~~ | ~~TBD~~ | ~~Furter updates will be handled in the maintenance phase and/or company contributions.~~ |