**3GPP TSG-RAN WG2 Meeting #124 R2-231xxxx**

**Chicago, USA, Nov. 13th – 17th, 2023**

**Agenda item:** 7.2.1

**Source:** Intel Corporation

**Title:** [Post124][419][POS] TS 38.355 finalisation (Intel)

**Document for:**  Discussion and decision

# Introduction

This is the report of following email discussion:

Short email discussions, Deadline Dec. 1st 1000 UTC

* [Post124][419][POS] TS 38.355 finalisation (Intel)

 Scope: Finalise and check TS 38.355 (including taking into account updates to the RAN1 parameter list).

 Intended outcome: Endorsed TS

 Deadline for companies to provide comments: Nov 29 10:00 UTC

Rapporteur would like to set an early deadline Nov 29 10:00 UTC for company to provide comments in order to leave time for Rapporteur to update the specification.

#  Contact Information

Respondents to the email discussion are kindly asked to fill in the following table.

|  |  |
| --- | --- |
| Company | Contact: E-mail |
| Intel | Yi.guo@intel.com |
| Huawei, HiSilicon | yinghaoguo@huawei.com |
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# Discussion

In RAN2#124, RAN2 made good progress on sidelink positioning. Following agreements are related to SLPP specification:

Agreements:

Specify the RSPP metadata in SLPP specification as an SLPP IE/separate module (in a separate section and is not expected to be included in any SLPP message).

LS to SA2 on the agreements on the RSPP metadata.

No need to include the following parameters in RSPP metadata:

- metadata type (i.e., announced, required, satisfied);

- SLPP support;

- serving PLMN;

- positioning methods of anchor UE.

Agreements:

Agree the following proposals from R2-2312020 Report of [Post123bis][412][POS]

- 1 Close the open issue 19, remove the “Editor's note FFS With regards to duplicate detection: the applicability of the 10min inactivity rule. With regards to retransmission: the applicability of the timeout period of 250ms”.

- 2 Close open issue 26 and 30, Reuse the Request/Provide Assistance Data messages for server to get anchor UE’s location, and the ENs for issue 26 and 30 can be removed.

- 3 Close the open issue 25 for stage 3, and remove the corresponding ENs.

- 4 Close open issue 41, sequenceID is included in Provide Assistance Data message.

- 5 Request of sequenceID is included in CommonSL-PRS-MethodsIEsRequestAssistanceData, the value should be boolean and optional.

Check the changes on latest RAN1 parameters in R2-2312023, Draft TS 38.355 v1.3.0 via postmeeting email discussion.

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.

Close the open issue 9, endSessionFlag is not introduced in Rel-18

Close the open issue 24, 28, 31 on UE role. RAN2 will not capture the description of UE role for procedures.

Close the open issue 31 on Need code, delta signalling is not supported and Need code is not supported unless companies identify the real need.

Open issue 50 on relative location/velocity can be checked in maintenance phase.

Close the open issue 52, application layer ID is used in the SLPP specification.

Close the open issue 53 on QoS for AoA, capture the TP from R2-2312724 in SLPP specification.

Close the open issue 49, scheduled location between UE and the LMF is supported in the SLPP specification. E-CID like trigger event is not supported in the SLPP specification.

Proposal 2 from R2-2312127 is not pursued;

Update the TS 38.355 based on the proposal 3 from R2-2312127 on the periodical reporting;

Proposal 4 from R2-2312127 to change the max value for SL-RTT-AdditionalPathList and SL-TDOA-AdditionalPathList to 8 has been covered by latest RAN1 parameters “the maximum number of additional paths for SL-RSTD, SL-RTOA and SL Rx – Tx time difference to be equal to 8. The maximum number of additional paths for SL-AoA is equal to 2”, Will update the TS 38.355 accordingly;

Note: RAN1 has agreed

Define the maximum number of additional paths for SL-RSTD, SL-RTOA and SL Rx – Tx time difference to be equal to 8. The maximum number of additional paths for SL-AoA is equal to 2.

Update the TS 38.355 based on the proposal 10 from R2-2312807

- Clarify that RangeResult field under the LocationCoordinates IE of the CommonIEsProvideLocationInformation IE is in metric units of meters and update the value range to INTEGER (0..999).

- Clarify that the AzimuthResult and ElevationResult field under the LocationCoordinates IE of the CommonIEsProvideLocationInformation IE is in metric units of degrees and update the ElevationResult value rage to INTEGER (0..89).

Proposal 2 from R2-2313329 on the TP for section 4.2 of SLPP is not pursued;

Proposal 3 from R2-2312724 on the TP Reference direction can be discussed in maintenance phase;

RAN2 confirm that the support of SLPP is fully optional for the UE, i.e. there is no prerequisite for a SL positioning capable UE to support LPP. No specification impact;

RAN2 confirm that adopt the LPP approach (i.e. left to UE implementation) for SLPP on the support of multiple parallel SL positioning sessions. No specification impact.

RAN2 confirm that Separate LPP (for Uu positioning) and SLPP(for SL positioning) is used as the baseline for hybrid positioning..

Proposal 6 from R2-2313329 on sessionType is not pursued;

Proposal 7 from R2-2313329 on common time reference has been covered by RAN1 new parameters sl-Timestamp, tx-Time-Info. Will update the TS 38.355 accordingly.

Proposal 5 and 6 from R2-2312254 on SA2 issues are not pursued; Companies can discuss this in SA2 directly.

R2-2312021 TS 38.355 v1.2.0 Intel Corporation draft TS Rel-18 38.355 1.2.0 NR\_pos\_enh2

 Endorsed [to be progressed during this meeting]

RAN1 also sent the updated RAN1 parameters in R1-2312697;

## 3.1 Open issue status for TS 38.355

The updated open issue list is shown in the table 1:

Table 1: open issue list for TS 38.355

|  |  |  |  |
| --- | --- | --- | --- |
| **Topic** | **Open issues** | **Related to the completion of the WI** | **Remark** |
| **4.1 SLPP general**[RAN2#124] All issues have been resolved; | * 0 To complete 4.1.1 SLPP Configuration
 | Yes | TP provided by Rapporteur (need confirmation): 0* See draft TS 38.355 v1.2.0, user name R2-2310222
 |
| * 1 To complete 4.1.2 SLPP Sessions and Transactions
* 2 Editor’s note FFS on the definition of SLPP Session.
* 3 Editor's note FFS on the definition of sessionID.
* 4 FFS within what scope the session ID is unique.
* 5 LMF involved case, FFS on how to handle session for UEs involved in the same LMF involved SL based positioning and the relationship between routing ID/correlation ID and session ID. (RAN2#123bis the agreements for SLPP can be applied for LMF involved case unless the issue is identified. FFS on session ID handling since it is also related to forwarding case.)
* 6 FFS if this involves single or separate SLPP sessions (LMF  UE1 and UE1  UE2).
* 7Editor's note FFS on SLPP message header, e.g. cast type, UE ID
* 8 Editor's note FFS the details of initiator in SLPP-TransactionID.
* 9 RAN2#123bis, FFS to introduce endSession Boolean value in the message header with/without the messageBody. When set to FALSE, endSession indicates an active SLPP session. When set to TRUE, endSession indicates the SLPP session has concluded. When set to TRUE, the message should always request an acknowledgement
 | Yes | Resolved (based on RAN2 agreements or RANP agreements): 3, 4, 7, 8RAN2 already agreed * Reuse the LPP transaction mechanism to SLPP.
* 6 octets length session ID
* Not to support initiator ID unless companies identify the use case for it.
* the agreements for SLPP can be applied for LMF involved case unless the issue is identified. FFS on session ID handling since it is also related to forwarding case.

TP provided by Rapporteur (need confirmation): 1, 2* See draft TS 38.355 v1.2.0, user name R2-2310222 and R2-2310219

Company contribution: 5, 6, 9* Issues 5, 6, 9 have been concluded in [RAN2#124].
 |
| * 10 To complete 4.1.3 SLPP Position Methods
* 11 Editor’s note FFS on the supported positioning methods.
 | Yes | Resolved (based on RAN2 agreements): 11RAN2 already agreed * Introduce the following SLPP position methods:

- SL-RTT,- SL-AoA,- SL-TDOA,- SL-TOA.TP provided by Rapporteur (need confirmation): 10* See draft TS 38.355 v1.2.0, user name R2-2310222
 |
| * 12 To complete 4.1.4 SLPP Messages
 | Yes | TP provided by Rapporteur (need confirmation): 12* See draft TS 38.355 v1.2.0, user name R2-2310222
 |
| **4.2 Common SLPP Session Procedure**[RAN2#124] All issues have been resolved; | * 13 To complete 4.2 Common SLPP Session Procedure
 | Yes | TP provided by Rapporteur (need confirmation): 13* See draft TS 38.355 v1.2.0, user name R2-2310219
 |
| **4.3 SLPP Transport**[RAN2#124] All issues have been resolved; | * 14To complete 4.3 SLPP Transport
* 15 Editor's note FFS on whether SLPP message Segmentation is needed.
* 16 Editor's note FFS on the support of session-less operation.
* 17 Editor's note May be updated based on the discussion on session management.
* 18 Editor's note FFS on the support of broadcast/groupcast.
* 19 Editor's note FFS With regards to duplicate detection: the applicability of the 10min inactivity rule. With regards to retransmission: the applicability of the timeout period of 250ms.
 | Yes | Resolved (based on RAN2 agreements or RANP): 15, 16, 18RAN2 already agreed * Not support SLPP segmentation in Rel-18.

TP provided by Rapporteur (need confirmation): 14, 17* See draft TS 38.355 v1.2.0, user name R2-2310222

Solution to be provided by Rapporteur (need confirmation, see question 1): 19* Issues 19 have been concluded in [RAN2#124].
 |
| **5 SLPP Procedures**[RAN2#124] All issues have been resolved; | * 20 To complete 5 SLPP Procedures
* 21 Editor's note The content of each section will be added in accordance with future agreements, not based on LPP legacy directly.
* 22 Editor's note FFS on whether to add procedure description in the field description as LPP.

**Capability exchange:*** 23 Editor's note FFS if the server obtains the capabilities from corresponding UE directly or for some UEs based on forwarding.
* 24 Editor's note FFS if any UEs can request the capabilities from the peer UE. FFS on Endpoint A can also be the server UE

**Assistance information exchange:*** 25 Reuse the Request/Provide Assistance Data messages for server to get the assistance data from Anchor UEs. FFS on how to capture.
* 26 FFS on whether anchor UE location can be obtained via this procedure;
* 27 Editor's note FFS whether the server can communicate with corresponding UE directly or for some UEs based on forwarding.
* 28 Editor's note FFS if any UEs can trigger the assistance data transfer procedure.

**Location information exchange:*** 29 Editor's note FFS if the server obtains the location information from corresponding UE directly or for some UEs based on forwarding.
* 30 Editor's note FFS if the procedure is used by server to obtain anchor location from the anchor UE;
* 31 Editor's note FFS if any UEs can trigger the location information transfer procedure.
 | Yes | RAN2 already agreed * Same as proposal in 401, the provide assistance data message contains multiple SL-PRS configurations.
* The SL-PRS sequence ID can be provided to the TX UE by the LMF/Server UE (via SLPP signalling). If the Tx UE does not receive a sequence ID via SLPP message from the server, the Tx UE is expected to select one by itself. FFS exact SLPP signalling.
* Reuse the Request/Provide Assistance Data messages for server to get the assistance data from Anchor UEs. FFS on how to capture.
* For absolute sidelink positioning, the locations of the anchor UEs are provided to the entity that does the location calculation.

TP provided by Rapporteur (need confirmation):, 20, 21, 22* See draft TS 38.355 v1.2.0, user name R2-2310221 and RAN2#123bis

Forwarding issue to be discussed in [Post 404]:, 23, 27, 29* Issues 23, 27, 29 have been concluded in [RAN2#124].

UE role issue rely on companies’ contribution: 24, 28, 31* Issues 24, 28, 31 have been concluded in [RAN2#124].

Solution to be provided by Rapporteur (need confirmation, , see question 2,3): 25, 26, 30* Issues 25, 26, 30 have been concluded in [RAN2#124].
 |
| **6.1 General**[RAN2#124] All issues have been resolved; | * 32 Editor's note FFS on Need code (e.g. how to support no UL/DL), support of delta signalling, full configuration, import IE from LPP, setup/release.
* 33 Editor's note The structure may be updated based on RAN1 agreements/parameter list.
 | Yes | Resolved (based on RAN2 agreements or RANP): 33RAN2 already agreed * Introduce an additional SLPP PDU (e.g., SLPP-PDU-Common-SL-PRS-Methods-Contents), which specifies common content for SL-PRS methods only. We still keep positioning specific PDU for future proof.

Company contribution: 32* Issues 32 have been concluded in [RAN2#124].
 |
| **6.2 SLPP messages**[RAN2#124] All issues have been resolved; | * 34 To complete 6.2 SLPP messages
* - Request Capabilities;
* - Provide Capabilities;
* - Request Assistance Data;
* - Provide Assistance Data;
* - Request Location Information;
* - Provide Location Information;
* - Abort;
* - Error.
 | Yes | TP provided by Rapporteur (need confirmation): 34See draft TS 38.355 v1.2.0, user name R2-2310220 |
| **To capture RAN1 /4 parameters**[RAN2#124] to be done in v 1.3.0 | General- Handling on positioning method specific parameters* 35 Editor's note FFS on whether any positioning method specific capability IEs should be grouped by positioning method.
* 36 Which parameters shall be put under common, which should be put under positioning method specific IE
 | Yes | TP provided by Rapporteur (need confirmation): 36* See draft TS 38.355 v1.2.0, user name R2-2310216 and RAN2#123bis

Wait for further inputs from RAN1/RAN4: 36Rapporteur will provide TP on latest RAN1 parameter in Nov meeting. Xiaomi to provide the TP on 35, see [Post][407]* Issues 35 to be concluded in capability postmeeintg email discussion in [Post124][418]
* Issue 36 can be closed, business as usual.
 |
|  | Assistance data:* 37, The details of ProvideAssistanceData and RequestAssistanceData
* 38 How to inform the Rx UE of the parameters for the SL PRS configuration used by Tx UE (if it is done by server, how can server get the information)
* 39 How to capture SL-PRS configuration, common section and then invoked by positioning method specific IE or?
* 40 Capture RAN1 parameters
* 41 The SL-PRS sequence ID can be provided to the TX UE by the LMF/Server UE (via SLPP signalling). If the Tx UE does not receive a sequence ID via SLPP message from the server, the Tx UE is expected to select one by itself. FFS exact SLPP signalling.
 | Yes | Resolved (based on RAN2 agreements or RANP): 38, 39RAN2 already agreed * Introduce an additional SLPP PDU (e.g., SLPP-PDU-Common-SL-PRS-Methods-Contents), which specifies common content for SL-PRS methods only. We still keep positioning specific PDU for future proof.
* Same as proposal in 401, the provide assistance data message contains multiple SL-PRS configurations.
* Reuse the Request/Provide Assistance Data messages for server to get the assistance data from Anchor UEs. FFS on how to capture.

TP provided by Rapporteur (need confirmation): 37, 40* See draft TS 38.355 v1.2.0, user name R2-2310216 and RAN2#123bis

Solution to be provided by Rapporteur (need confirmation, see question 4): 41Wait for further inputs from RAN1/RAN4: 37,40Rapporteur will provide TP on latest RAN1 parameter in Nov meeting.* Issue 37 and 40 can be closed, business as usual.
 |
|  | Measurement reporting:* 42 The details of Provide Location Information;
* 43 Mapping between measurement results and positioning methods
* 44 separate positioning methods for SL-RSTD and SL-RTOA
* 45 Capture RAN1 parameters
 | Yes | Resolved (based on RAN2 agreements or RANP): 42 (Ranging), 44RAN2 already agreed * Introduce an additional SLPP PDU (e.g., SLPP-PDU-Common-SL-PRS-Methods-Contents), which specifies common content for SL-PRS methods only. We still keep positioning specific PDU for future proof.
* Introduce the following SLPP position methods:
* - SL-RTT,
* - SL-AoA,
* - SL-TDOA,
* - SL-TOA.
* Working assumption: Add Range and Direction as one choice in the LocationCoordinates IE. We may revise it if RAN1 have different view.

TP provided by Rapporteur (need confirmation): 42,43, 45* See draft TS 38.355 v1.2.0, user name R2-2310216 and RAN2#123bis

Wait for further inputs from RAN1/RAN4: 42, 43, 45Rapporteur will provide TP on latest RAN1 parameter in Nov meeting.* Issues 42, 43 and 45 can be closed, business as usual.
 |
|  | Measurement request:* 46 The details of Request Location Information;
* 47 Capture RAN1 parameters
 | Yes | Resolved (based on RAN2 agreements or RANP): 46 (ranging)RAN2 already agreed * Working assumption: Add Range and Direction as one choice in the LocationCoordinates IE. We may revise it if RAN1 have different view.

TP provided by Rapporteur (need confirmation): 46, 47* See draft TS 38.355 v1.2.0, user name R2-2310216 and RAN2#123bis

Wait for further inputs from RAN1/RAN4: 46, 47Rapporteur will provide TP on latest RAN1 parameter in Nov meeting.* Issues 46 and 47 can be closed, business as usual.
 |
| **To capture RAN1/RAN4 feature list**[RAN2#124] to be done in v 1.3.0 | To capture RAN1/RAN4 feature list* 48 The details of Request Capabilities and Provide Capabilities;
 | Yes | Xiaomi to provide the TP on 48, see [Post][407]* Issues 48 to be concluded in capability postmeeintg email discussion in [Post124][418]
 |
| **To capture RAN2 feature list**[RAN2#124] to be done in v 1.3.0 | 49 To capture RAN2 feature list* FFS on support of scheduled location time
* FFS on support of triggerEvent
 | Yes | Xiaomi to provide the TP on 49, see [Post][407]Company contribution: 49 on two FFS issues.* Issues 49 RAN2 features to be concluded in capability postmeeintg email discussion in [Post124][418]
* Issues 49 scheduled location time and triggered event have been concluded in [RAN2#124].
 |
| **Issues identified in [Post123bis][412]**[RAN2#124] All issues have been resolved except issue 50 which will be considered in maintenance phase | 50 relative location/velocity. |  | Company contribution: 50* Issues 50 to be considered in maintenance phase
 |
| 51 The request details need to be added for assistance data request and location request. That will be done in next version for Nov meeting. |  | Rapporteur will provide the draft TP on 51* Issues 51 has been covered in TS 38.355 v1.3.0
 |
| 52 Editor's note FFS if layer2ID or applicationLayerID should be used. |  | Company contribution: 52* Issues 52 has been concluded in [RAN2#124].
 |
| 53 whether there are also QoS for angle estimate, like for positonig method SL-AoA |  | RAN1 or RAN2 issue?Company contribution: 53* Issues 53 has been concluded in [RAN2#124].
 |
| **Maintenace phase** | 50 relative location/velocity. |  |  |
|  | So far, we did not identity the content for some IEs, e.g. commonIEsRequestCapabilities, CommonSL-PRS-MethodsIEsRequestLocationInformation. Further discuss whether these empty IEs should be deleted in maintenance phase. |  |  |
|  | Further RAN1/4 inputs if any |  |  |
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**Q1: Is any issue missing from the list? Please add if any.**

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| --- | --- | --- |
| **Company’s name** | **Section** | **Missing issues** |
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## 3.2 Summary of the changes in the draft TS 38.355 v1.3.0

Following changes have been captured in draft TS 38.355 v 1.3.0”

* RAN1 parameters in R1-2312697
* RAN2 agreements:

close the open issue 24, 28, 31 on UE role. RAN2 will not capture the description of UE role for procedures.

close the open issue 31 on Need code, delta signalling is not supported and Need code is not supported unless companies identify the real need.

close the open issue 52, application layer ID is used in the SLPP specification.

close the open issue 53 on QoS for AoA, capture the TP from R2-2312724 in SLPP specification.

close the open issue 49, scheduled location between UE and the LMF is supported in the SLPP specification. E-CID like trigger event is not supported in the SLPP specification.

Update the TS 38.355 based on the proposal 3 from R2-2312127 on the periodical reporting;

the proposal 4 from R2-2312127 to change the max value for SL-RTT-AdditionalPathList and SL-TDOA-AdditionalPathList to 8 has been covered by latest RAN1 parameters “the maximum number of additional paths for SL-RSTD, SL-RTOA and SL Rx – Tx time difference to be equal to 8. The maximum number of additional paths for SL-AoA is equal to 2”, Will update the TS 38.355 accordingly;

Note: RAN1 has agreed

Define the maximum number of additional paths for SL-RSTD, SL-RTOA and SL Rx – Tx time difference to be equal to 8. The maximum number of additional paths for SL-AoA is equal to 2.

Update the TS 38.355 based on the proposal 10 from R2-2312807

- Clarify that RangeResult field under the LocationCoordinates IE of the CommonIEsProvideLocationInformation IE is in metric units of meters and update the value range to INTEGER (0..999).

- Clarify that the AzimuthResult and ElevationResult field under the LocationCoordinates IE of the CommonIEsProvideLocationInformation IE is in metric units of degrees and update the ElevationResult value rage to INTEGER (0..89).

Specify the RSPP metadata in SLPP specification as an SLPP IE/separate module (in a separate section and is not expected to be included in any SLPP message).

**Q2: Companies are invited to provide comments/suggestions on the draft TS 38.355 v1.3.0 in the following table.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Company** | **Section and issues** | **Suggestion** | **Rapporteur comments** |
| Huawei, HiSilicon | 2 References | We should add 23.586 to the reference | Updated in v02 |
| Huawei, HiSilicon | 3.1 Terms | It might also be better to add definition for ranging/sidelink positioning to the clause of definitions and we can cite 23.586 | Updated in v02 |
| Huawei, HiSilicon |  | We should remove all the commented text after – in this submission? | EN/FFS is allowed for SLPP. Clean version with change mark will be submitted to RANP.  |
| Huawei, HiSilicon | 5.1.3 | The figure looks a bit funny that there is no space between “d” and “p” in the word “endpoint” | Updated in v02 |
| Huawei, HiSilicon | 5.2.5 Reception of SLPP Request Assistance DataUpon receiving a *RequestAssistanceData* message, Endpoint B shall generate a *ProvideAssistanceData* message as a response.Endpoint B shall:1> for each positioning method for which a request for assistance data is included in the message:2> if Endpoint B supports this positioning method:3> include the assistance data for that supported positioning method in the response message;1> set the IE *SessionID* in the response message to the same value as the IE *SessionID* in the received message if received;1> set the IE S*LPP-TransactionID* in the response message to the same value as the IE S*LPP-TransactionID* in the received message;1> deliver the response message to lower layers for transmission. | Is it possible for endpiontA to request the AD for the positioning methods that endpoint B does not support from the Enpoint B after the UE capability exchange? | Good question. It should be error case. We either add it here or separate handling in section 5.4 Error handling, or leave it to implementation. Would prefer to keep it here. But willing to hear companies’ view.  |
| Huawei, HiSilicon | The ASN.1 in this clause uses the same format and coding conventions as described in Annex A of TS 38.331 [2]. The need code is not used in this release of the specification. Upon receiving a message with the field absent, the UE releases the current value. | On the part highlighted in yellow, we don’t need to say what is not supported in the current spec? only the second sentence specifying what is the expected behavior would be enoughOn the part highlighted in green, maybe we need to clarify that this is only applicable for ProcideAsssitanceData? | Upated in v02. Removed “The need code is not used in this release of the specification.”Some companies commented that the delta signalling can also be applicable for RequestLocationInformation. Therefore I did not add the restriction. |
| Huawei, HiSilicon | NOTE 1: An implementation needs to include only the supported "Method" PDUs. Not supported methods do not need to be included, and therefore, do not contribute to the protocol size. For example, if SL-RTT is not supported by an implementation, the *SLPP-PDU-SL-RTT-Contents* PDU does not need to be included in the protocol.NOTE 2: An implementation supporting SL-RTT, SL-AoA, SL-TDOA, or SL-TOA must also support the *SLPP-PDU-CommonSL-PRS-MethodsContents* PDU. | We don’t need to explain the monitvation why different pos methods are defined in different module in the spec and the part of “do not contribute to the protocol size” is not needed?  | Upated in v02. |
| Huawei, HiSilicon | RequestCapabilities-IEs ::= SEQUENCE { commonIEsRequestCapabilities OCTET STRING OPTIONAL, -- Containing CommonIEsRequestCapabilities commonSL-PRS-MethodsIEsRequestCapabilities OCTET STRING OPTIONAL, -- Containing CommonSL-PRS-MethodsIEsRequestCapabilities sl-AoA-RequestCapabilities OCTET STRING OPTIONAL, -- Containing SL-AoA-RequestCapabilities sl-RTT-RequestCapabilities OCTET STRING OPTIONAL, -- Containing SL-RTT-RequestCapabilities sl-TDOA-RequestCapabilities OCTET STRING OPTIONAL, -- Containing SL-TDOA-RequestCapabilities sl-TOA-RequestCapabilities OCTET STRING OPTIONAL, -- Containing SL-TOA-RequestCapabilities lateNonCriticalExtension OCTET STRING OPTIONAL, nonCriticalExtension SEQUENCE {} OPTIONAL} | We are not quite sure why we need to separate commonIEsRequestCapabilities and commons-PRS-MethodsIEsRequestCapabilityes into two fields?Is there a case that the UE does not support one of them and only suppor the other one? | We agreed to have separate ASN.1 module, and therefore introduced full lists of message for each module. So far, we did not identity the content for some IEs, e.g. commonIEsRequestCapabilities, CommonSL-PRS-MethodsIEsRequestLocationInformation. We can discuss whether these empty IEs should be deleted in maintenance phase. I also added it in the open issue list.  |
| Huawei, HiSilicon | ScheduledLocationTime ::= SEQUENCE { utcTime UTCTime OPTIONAL, gnssTime SEQUENCE { gnss-TOD-Msec INTEGER (0..3599999), gnss-TimeID GNSS-ID } OPTIONAL, nrTime SEQUENCE { nr-PhysCellID NR-PhysCellID, nr-ARFCN ARFCN-ValueNR, nr-CellGlobalID NCGI OPTIONAL, nr-SFN INTEGER (0..1023), nr-Slot CHOICE { scs15 INTEGER (0..9), scs30 INTEGER (0..19), scs60 INTEGER (0..39), scs120 INTEGER (0..79) } OPTIONAL } OPTIONAL, relativeTime INTEGER (1..1024) OPTIONAL} | A dash “-“ is needed utc-Time, gnss-Time, nr-Time | Upated in v02. |
| Huawei, HiSilicon | L-AoA-AssistanceData ::= SEQUENCE { applicationLayerID OCTET STRING, expectedSL-AzimuthAoA-AndUncertainty INTEGER(0..3599), -- expected-SL-AoA-and-Uncertainty expectedSL-ZenithAoA-AndUncertainty INTEGER(0..1799), -- expected-SL-AoA-and-Uncertainty ...}-- TAG-SL-AoA-PROVIDEASSISTANCEDATA-STOP-- ASN1STOP | Not sure why application layer ID is mandatory. For provide assistance data, it may not be needed in the case of SLPP transported on PC5-U. the PC5 link is per Tx Rx UE and both parties should already known the application layer ID when it exchanges SLPP on PC5-U. Application layer ID is needed in the case when the UE sends the SLPP message to the LMF or server UE | SL-AoA-ProvideAssistanceData ::= SEQUENCE { sl-AoA-AssistanceDataInfo SEQUENCE (SIZE (1..maxNrOfSLTxUEs)) OF SL-AoA-AssistanceData OPTIONAL, ...}The parent IE contains the list of SL-AoA-AssistanceData, therefore applicationLayerID is needed to distinguish different Tx UEs.If there is only one Tx UE, agree with you that applicationLayerID may not be needed. Keep it as mandatory for now.  |
| ZTE | SL-TimeStamp ::= SEQUENCE { dfn-Time SEQUENCE { syncSourceType ENUMERATED { gnss, ue} OPTIONAL, applicationLayerID OCTET STRING OPTIONAL, dfn INTEGER (0.. 1023), nr-Slot CHOICE { scs15 INTEGER (0..9), scs30 INTEGER (0..19), scs60 INTEGER (0..39), scs120 INTEGER (0..79) } } RTD-InfoListPerTxUE ::= SEQUENCE { applicationLayerID OCTET STRING, rtdBetweenAnchorUEs CHOICE { subframeOffset INTEGER (0..1966079), sl-OffsetDFN INTEGER (0..1000) }, rtd-Quality SL-TimingQuality} | DFN value in SL-TimeStamp is 0~1023, however sl-OffsetDFN in SL-RTD-Info is 0~1000. Is this a mismatch? |  |
| ZTE | – *SL-RTD-Info*The IE *SL-RTD-Info* provides time synchronization information of anchor UEs between a UE and LMF or another UE.-- ASN1START-- TAG-SL-RTD-INFO-STARTSL-RTD-Info ::= SEQUENCE { referenceRTD-Info ReferenceRTD-Info, rtd-InfoList RTD-InfoList}ReferenceRTD-Info ::= SEQUENCE { syncSourceType ENUMERATED { gnss, gNB-eNB, ue}, applicationLayerID OCTET STRING OPTIONAL, nrCell-Identify SEQUENCE { nr-PhysCellID NR-PhysCellID, nr-ARFCN ARFCN-ValueNR, nr-CellGlobalID NCGI OPTIONAL } OPTIONAL}RTD-InfoList ::= SEQUENCE (SIZE (1.. maxNrOfSLTxUEs)) OF RTD-InfoListPerTxUERTD-InfoListPerTxUE ::= SEQUENCE { applicationLayerID OCTET STRING, rtdBetweenAnchorUEs CHOICE { subframeOffset INTEGER (0..1966079), sl-OffsetDFN INTEGER (0..1000) }, rtd-Quality SL-TimingQuality}-- TAG-SL-RTD-INFO-STOP-- ASN1STOP | R1’s parameter list is:

|  |  |  |  |
| --- | --- | --- | --- |
| sync-Info-for-SL-TDOA-TOA | New | Indicates synchronization information of anchor UEs between a UE and LMF or another UE.Synchronization information includes:• The synchronization source type (GNSS, gNB/eNB, and UE) of anchor UEs• The RTD between anchor UEs  | Sync source type: enumerated {GNSS, gNB/eNB, UE}- If the synchronization source of an anchor UE is gNB/eNB, the anchor UE can further provide cell identity informationFor RTD between anchor UEs:- subframeOffset with value range INTEGER (0..1966079)OR sl-OffsetDFN with value range INTEGER (1..1000)- rtdQuality: ref. NR-TimingQuality. |

Each anchor UE should be allowed to report synchronization type, not only reference anchor UE. |  |
| ZTE |  sfn-Time SEQUENCE { nr-PhysCellID NR-PhysCellID, nr-ARFCN ARFCN-ValueNR, nr-CellGlobalID NCGI OPTIONAL, nr-SFN INTEGER (0..1023), nr-Slot CHOICE { scs15 INTEGER (0..9), scs30 INTEGER (0..19), scs60 INTEGER (0..39), scs120 INTEGER (0..79) } } OPTIONAL | Optional should be added. Also R1 agreement ‘For the timestamp of SFN and slot number, at least one of nr-PhysCellID, nr-ARFCN, nr-CellGlobalID is included.’ should be captured in the field description |  |
| ZTE | SL-PRS-AssistanceData ::= SEQUENCE { applicationLayerID OCTET STRING, sl-PRS-SequenceID INTEGER(0..4095) OPTIONAL, -- SL PRS sequence generation, from server to Tx UE sl-POS-ARP-ID-Tx INTEGER (1..4) OPTIONAL, -- sl-pos-arpID-Tx ...} | sl-pos-arpID-Tx should contain ‘ARP ID, Tx time stamp, SL PRS resource ID (optional)’. not only a ID |  |
| ZTE | SL-AoA-MeasElement ::= SEQUENCE { los-NLOS-Indicator LOS-NLOS-Indicator OPTIONAL, -- sl-losNlosIndicator sl-AngleQuality MeasurementAngleQuality OPTIONAL, -- sl-AngleQuality sl-AoA-AdditionalPathList SL-AoA-AdditionalPathList OPTIONAL, sl-AzimuthAoA-FirstPathResult INTEGER (0..3599) OPTIONAL, -- sl-PRS-AoA sl-AzimuthAoA-LCS-GCS-Translation LCS-GCS-Translation OPTIONAL, -- sl-LCS-to-GCS-translation sl-POS-ARP-ID-Rx INTEGER (1..4) OPTIONAL, -- sl-pos-arpID-Rx sl-PRS-ResourceId INTEGER (0..16) OPTIONAL, -- sl-PRS-ResourceId sl-PRS-RSRP-Result INTEGER (0..126) OPTIONAL, -- sl-PRS-RSRP sl-PRS-FirstPathRSRPP-Result INTEGER (0..126) OPTIONAL, -- sl-PRS-RSRPP sl-TimeStamp SL-TimeStamp OPTIONAL, -- sl-Timestamp sl-TimingQuality SL-TimingQuality OPTIONAL, -- sl-TimingQuality sl-ZenithAoA-FirstPathResult INTEGER (0..1799) OPTIONAL, -- sl-PRS-AoA sl-ZenithAoA-LCS-GCS-Translation LCS-GCS-Translation OPTIONAL, -- sl-LCS-to-GCS-translation ...}SL-AoA-AdditionalPathList ::= SEQUENCE (SIZE(1..2)) OF SL-AoA-AdditionalPathSL-AoA-AdditionalPath ::= SEQUENCE { sl-AngleQuality MeasurementAngleQuality OPTIONAL, -- sl-AngleQuality sl-AzimuthAoA-AdditionalPathResult INTEGER (0..3599) OPTIONAL, -- additionalPath-SL-PRS-AoA sl-AzimuthAoA-LCS-GCS-Translation LCS-GCS-Translation OPTIONAL, -- sl-LCS-to-GCS-translation sl-ZenithAoA-AdditionalPathResult INTEGER (0..1799) OPTIONAL, -- additionalPath-SL-PRS-AoA sl-ZenithAoA-LCS-GCS-Translation LCS-GCS-Translation OPTIONAL, -- sl-LCS-to-GCS-translation sl-PRS-AdditionalPathRSRPP-Result INTEGER (0..126) OPTIONAL, -- additionalPath-SL-PRS-RSRPP sl-PRS-ResourceId INTEGER (0..16) OPTIONAL, -- sl-PRS-ResourceId sl-POS-ARP-ID-Rx INTEGER (1..4) OPTIONAL, -- sl-pos-arpID-Rx sl-TimeStamp SL-TimeStamp OPTIONAL, -- sl-Timestamp sl-TimingQuality SL-TimingQuality OPTIONAL, -- sl-TimingQuality ...} | Timing quality should not be reported for SL-AoA. Green part should be deleted |  |
| ZTE | SL-AoA-RequestLocationInformation ::= SEQUENCE { sl-LOS-NLOS-IndicatorRequest ENUMERATED { true } OPTIONAL, sl-PRS-RSRP-Request ENUMERATED { true } OPTIONAL, sl-FirstPathRSRPP-Request ENUMERATED { true } OPTIONAL, sl-AdditionalPathsRequest ENUMERATED { true } OPTIONAL, ...} | SL-AoA should also add request Rx ARP information, like other methods |  |
| Qualcomm | 4.1.2 SLPP Sessions and Transactions | There is only a description for Transactions, but not for Sessions, e.g.,:"The instigator of an SLPP session will always instigate the first SLPP transaction,""SLPP transactions are indicated at the SLPP protocol level with a transaction ID""Messages within a transaction are linked by a common transaction identifier"etc.Shouldn't there also be a brief description on handling of Session IDs?  |  |
| Qualcomm | *– SLPP-TransactionID*SLPP-TransactionID ::= SEQUENCE { transactionNumber TransactionNumber}TransactionNumber ::= INTEGER (0..255) | Not clear why this got a dedicated section. *SequenceNumber* and *SessionID* are in *SLPP-Message*. *TransactionId* should be there as well. Also, not clear why a separate outer SEQUENCE is needed for *SLPP-TransactionID*. |  |
| Qualcomm | ***abortCause***This IE defines the request to abort an ongoing procedure. The abort cause '*stopPeriodicReporting*' should be used by the location server to stop any ongoing location reporting configured as *periodicalReporting* in the *CommonIEsRequestLocationInformation*. | Only by a location server? I guess it should be "endpoint"? (may apply to other field descriptions as well). |  |
| Qualcomm | – *EllipsoidPointWithAltitudeAndUncertaintyEllipsoid* | Why is the EllipsoidPointWithAltitudeAndUncertaintyEllipsoid defined in *SLPP-Message* but all the other GAD shapes in CommonIEsRequestLocationInformation? |  |
| Qualcomm | 6.3.1 Common information elements | It seems most elements in this section (apart from the GAD shape, *CommonIEsAbort, CommonIEsError*) are not really "common" (in the strict sense)?I think those should be in *SLPP-PDU-CommonSL-PRS-MethodsContents?*And the "true" common elements in *SLPP-PDU-CommonContents*?Similar to the *Multiplicity and type constraint definitions.* Those seems only applicable to *SLPP-PDU-CommonSL-PRS-MethodsContents.* |  |
| Qualcomm | GNSS-ID ::= SEQUENCE { gnss-id ENUMERATED{ gps, sbas, qzss, galileo, glonass, bds, navic }} | Why is the GNSS-ID embedded in a SEQUENCE? I'ts not extensible anyhow? |  |
| Qualcomm | LocationInformationType | Which type would be applicable for direction (azimuth/elevation)? E.g., is "range" also applicable to direction? |  |
| Qualcomm | ***locationInformationType***This IE indicates whether the server requires a location estimate or measurements. For '*locationEstimateRequired*' or '*rangeEstimateRequired*' , the target device shall return a location or range estimate if possible, or indicate a location error if not possible. For '*locationMeasurementsRequired*  '*rangeMeasurementsRequired*'', the target device shall return measurements if possible, or indicate a location error if not possible. For '*locationEstimatePreferred*' or '*rangeEstimatePreferred*', the target device shall return a location or range estimate if possible, but may also or instead return measurements for any requested position methods for which a location estimate is not possible. For '*locationMeasurementsPreferred or* '*rangeMeasurementsPreferred*'', the target device shall return location or range measurements if possible, but may also or instead return a location estimate for any requested position methods for which return of location measurements is not possible. | Similar to above. Is this only for the server? E.g., does "ranging" require a server? (seems to imply that any UE which supports e.g., SL-RTT and SL-AoA is a target/anchor/server simultaneously?) |  |
| Qualcomm | ***periodicalReporting***This IE indicates that periodic reporting is requested and comprises the following subfields:- ***reportingAmount*** indicates the number of periodic location information reports requested. Enumerated values correspond to 2, 4, 8, 16, 32, 64, or infinite/indefinite number of reports. If the *reportingAmount* is '*infinite/indefinite'*, the target device should continue periodic reporting until an SLPP *Abort* message is received. - ***reportingInterval*** indicates the interval between location information reports and the response time requirement for the first location information report. Enumerated values ri0-25, ri0-5, ri1, ri2, ri4, ri8, ri16, ri32, ri64 correspond to reporting intervals of 1, 2, 4, 8, 10, 16, 20, 32, and 64 seconds, respectively. Measurement reports containing no measurements or no location estimate are required when a *reportingInterval* expires before a target device is able to obtain new measurements or obtain a new location estimate. | This is legay LPP. The ENUMERATED values can be directly ri1, ri2, etc. |  |
| Qualcomm | LocationCoordinates ::= CHOICE { ellipsoidPoint Ellipsoid-Point, ellipsoidPointWithUncertaintyCircle Ellipsoid-PointWithUncertaintyCircle, ellipsoidPointWithUncertaintyEllipse EllipsoidPointWithUncertaintyEllipse, polygon Polygon, ellipsoidPointWithAltitude EllipsoidPointWithAltitude, ellipsoidPointWithAltitudeAndUncertaintyEllipsoid EllipsoidPointWithAltitudeAndUncertaintyEllipsoid, ellipsoidArc EllipsoidArc, rangeAndDirection RangeAndDirection, ...} | (a) range and direction are not really location coordinates.(b) It is not clear how a UE can request/report direction only. It seems this is always rangeAndDirection? Is this intentional? |  |
| Qualcomm | ResponseTime ::= SEQUENCE { time INTEGER (1..128), unit ENUMERATED { ten-seconds, ten-milli-seconds} OPTIONAL, ...} | Is 10-seconds granularity really sensible for sidelink? |  |
| Qualcomm | CommonSL-PRS-MethodsIEsRequestAssistanceData | Isn't there an *applicationLayerID* needed? I.e., to indicate for which UE the AD are requested? |  |
| Qualcomm | SL-AoA-RequestAssistanceData  | Similar to above and all other methods:Isn't there an *applicationLayerID* needed? I.e., to indicate for which UE the AD are requested?  |  |
| Qualcomm | SL-AoA-RequestLocationInformation | Similar to above and all other methods:Isn't there an *applicationLayerID* needed?  |  |
| Qualcomm | SL-AoA-ProvideLocationInformationSL-AoA-SignalMeasurementInformation ::= SEQUENCE { sl-AoA-MeasList SEQUENCE (SIZE(1..maxNrOfSLTxUEs)) OF SL-AoA-MeasElement, ...}SL-AoA-MeasElement ::= SEQUENCE { los-NLOS-Indicator LOS-NLOS-Indicator OPTIONAL, -- sl-losNlosIndicator sl-AngleQuality MeasurementAngleQuality OPTIONAL, -- sl-AngleQuality sl-AoA-AdditionalPathList SL-AoA-AdditionalPathList OPTIONAL, sl-AzimuthAoA-FirstPathResult INTEGER (0..3599) OPTIONAL, -- sl-PRS-AoA sl-AzimuthAoA-LCS-GCS-Translation LCS-GCS-Translation OPTIONAL, -- sl-LCS-to-GCS-translation sl-POS-ARP-ID-Rx INTEGER (1..4) OPTIONAL, -- sl-pos-arpID-Rx sl-PRS-ResourceId INTEGER (0..16) OPTIONAL, -- sl-PRS-ResourceId sl-PRS-RSRP-Result INTEGER (0..126) OPTIONAL, -- sl-PRS-RSRP sl-PRS-FirstPathRSRPP-Result INTEGER (0..126) OPTIONAL, -- sl-PRS-RSRPP sl-TimeStamp SL-TimeStamp OPTIONAL, -- sl-Timestamp sl-TimingQuality SL-TimingQuality OPTIONAL, -- sl-TimingQuality sl-ZenithAoA-FirstPathResult INTEGER (0..1799) OPTIONAL, -- sl-PRS-AoA sl-ZenithAoA-LCS-GCS-Translation LCS-GCS-Translation OPTIONAL, -- sl-LCS-to-GCS-translation ...} | Similar to above and all other methods:Isn't there an *applicationLayerID* needed? How is the UE identified for which the SL-AoA-MeasElement is provided?In general, I see the applicationLayerID used as a UE identifier in only the below IEs. I would have thought this be included as part of all the UE messages to identify the sender/receiver (such as SL-AoA-ProvideCapabilities, SL-AoA-ProvideAssistanceData, SL-TOA-ProvideCapabilities, SL-RTT-ProvideCapabilities, SL-RTT-RequestLocationInformation, etc.). •SL-RTD-Info•SL-TimeStamp•SL-PRS-AssistanceData•SL-PositionCalculationAssistance•SL-AoA-AssistanceData•SL-TDOA-ProvideLocationInformation |  |
| Qualcomm | SL-AoA-MeasElement ::= SEQUENCE { los-NLOS-Indicator LOS-NLOS-Indicator OPTIONAL, -- sl-losNlosIndicator sl-AngleQuality MeasurementAngleQuality OPTIONAL, -- sl-AngleQuality sl-AoA-AdditionalPathList SL-AoA-AdditionalPathList OPTIONAL, sl-AzimuthAoA-FirstPathResult INTEGER (0..3599) OPTIONAL, -- sl-PRS-AoA sl-AzimuthAoA-LCS-GCS-Translation LCS-GCS-Translation OPTIONAL, -- sl-LCS-to-GCS-translation sl-POS-ARP-ID-Rx INTEGER (1..4) OPTIONAL, -- sl-pos-arpID-Rx sl-PRS-ResourceId INTEGER (0..16) OPTIONAL, -- sl-PRS-ResourceId sl-PRS-RSRP-Result INTEGER (0..126) OPTIONAL, -- sl-PRS-RSRP sl-PRS-FirstPathRSRPP-Result INTEGER (0..126) OPTIONAL, -- sl-PRS-RSRPP sl-TimeStamp SL-TimeStamp OPTIONAL, -- sl-Timestamp sl-TimingQuality SL-TimingQuality OPTIONAL, -- sl-TimingQuality sl-ZenithAoA-FirstPathResult INTEGER (0..1799) OPTIONAL, -- sl-PRS-AoA sl-ZenithAoA-LCS-GCS-Translation LCS-GCS-Translation OPTIONAL, -- sl-LCS-to-GCS-translation ...} | What is a sl-TimingQuality for AoA?(it's not described in the field description) |  |
| Qualcomm | SL-RTT-RequestLocationInformation field descriptions:**associatedSL-PRS-TxTimeStampRequest**This field, if present, indicates that the target device is requested to provide the associated SL PRS transmission time stamp. | Is this SL Target UE? If so, how is the Tx time stamp of the peer UE obtained?I think we can simply say "UE"? (may apply to other similar places as well). Or is there a difference between "target device" and "SL Target UE"? |  |

# Summary

Based on the input from companies, we have the following proposals: