3GPP TSG-RAN WG2 Meeting #118-e ***R2-22xxxxx***

Electronic Meeting, May 9 – 20, 2022

**Agenda item:** 6.11.1 / 6.11.2.8

**Source:** Qualcomm Incorporated

**Title:** Summary of [AT118-e][624][POS] 37355 positioning CR (Qualcomm)

**Document for:**  Discussion

# 1. Introduction

This document summarizes the following email discussion:

* [AT118-e][624][POS] 37355 positioning CR (Qualcomm)

Scope: Review and update the rapporteur CR (R2-2205829), taking into account decisions of this meeting. Discussion should coordinate with the handling of agenda item summaries.

Intended outcome: Agreeable CR in R2-2206247

Deadline: Tuesday 2022-05-17 1800 UTC

##### References:

[1] R2-2205828, "Summary of LPP Updates and Open Issues".

[2] R2-2205829, "LPP Updates".

[3] R2-2206326, "Rel-17 LPP RIL".

[4] R2-2206327, "Rel-17 LPP ASN1 Review File".

[5] R2-2206328, "LPP Updates and ASN.1 Review".

# 2. Discussion

Please provide your comments on "**Update\_of\_R2-2206328\_(draft CR 37355 LPP Updates).docx**" located in the same folder as this discussion document in the Table below.

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| --- | --- | --- | --- |
| Company | LPP Section / IE | RIL# (if applicable) | Comments |
| Huawei, HiSilicon | 6.4.3 |  | NR-DL-PRS-ExpectedLOS-NLOS-AssistancePerTRP-r17 ::= SEQUENCE {  dl-PRS-ID-r17 INTEGER (0..255),  nr-PhysCellID-r17 NR-PhysCellID-r16 OPTIONAL, -- Need ON  nr-CellGlobalID-r17 NCGI-r15 OPTIONAL, -- Need ON  nr-ARFCN-r17 ARFCN-ValueNR-r15 OPTIONAL, -- Need ON  nr-los-nlos-indicator-r17 CHOICE {  perTrp-r17 LOS-NLOS-Indicator-r17,  perResource-r17 SEQUENCE (SIZE (1..nrMaxSetsPerTrpPerFreqLayer-r16)) OF  NR-DL-PRS-ExpectedLOS-NLOS-AssistancePerResource-r17  } OPTIONAL, -- Cond Mandatory  ...  }  NR-DL-PRS-ExpectedLOS-NLOS-AssistancePerResource-r17 ::=  SEQUENCE (SIZE (1..nrMaxResourcesPerSet-r16)) OF  LOS-NLOS-Indicator-r17  -- ASN1STOP   | Conditional presence | Explanation | | --- | --- | | *Mandatory* | The field is mandatory present in this Release of the specification. |   Not sure why we need this conditional presence tag. if it is mandatory in this release, we only need to make it mandatory?  Rap: The IE would then not be (easily) extensible; e.g., if some additional LOS/NLOS indicator would be required in the future. However, it may be unlikely that other choices than perTRP and perResource are sensible. If so, we would then need a new parent assistance data IE --- should work as well. So I suggest deleting the OPTIONAL and condition. |
| Huawei, HiSilicon | 6.5.10.3 |  | – *NR-DL-TDOA-ProvideLocationInformation* The IE *NR-DL-TDOA-ProvideLocationInformation* is used by the target device to provide NR DL-TDOA location measurements to the location server. It may also be used to provide NR DL-TDOA positioning specific error reason.  -- ASN1START  NR-DL-TDOA-ProvideLocationInformation-r16 ::= SEQUENCE {  nr-DL-TDOA-SignalMeasurementInformation-r16  NR-DL-TDOA-SignalMeasurementInformation-r16  OPTIONAL,  nr-dl-tdoa-LocationInformation-r16 NR-DL-TDOA-LocationInformation-r16  OPTIONAL,  nr-DL-TDOA-Error-r16 NR-DL-TDOA-Error-r16 OPTIONAL,  ...,  [[  nr-DL-TDOA-SignalMeasurementInstances-r17  SEQUENCE (SIZE (1..maxMeasInstances-r17)) OF  NR-DL-TDOA-SignalMeasurementInformation-r16  OPTIONAL,  nr-DL-TDOA-LocationInformationInstances-r17  SEQUENCE (SIZE (1..maxMeasInstances-r17)) OF  NR-DL-TDOA-LocationInformation-r16  OPTIONAL  ]]  }  it should be clarified when the fields nr-DL-TDOA-SignalMeasurementInstances-r17 and nr-DL-TDOA-LocationInformationInstances-r17 are present, the r16 fields should be absent.  Rap: Added Cond statements. |
| CATT | 6.4.3  – Area-ID-CellList |  | The idea of camped/connected cell in the updated LPP doesn’t work smoothly. When the camped/connected cell doesn’t support DL-PRS (for some reason), but the neighbour cells support DL-PRS. Usually, LMF still may configure the DL-PRS of the neighbour cells which support DL-PRS without this camped/connected cell. Positioning still work smoothly in this scenario. In this case, the camped/connected cell which does not support DL-PRS will not be the reference cell in LMF.  But if we take the camped/connected cell id in the areaID-Celllist which indicates the valid DL-PRS cells, it won’t work smoothly. UE won’t take the cell8/6/5 as valid DL-PRS when the connected cell3 is not in the cell list. But obviously cell3 won’t be in the valid cell list because it doesn't support DL-PRS. So CATT suggest to fix this issue at this meeting or delete the cell list in asn.1 and think it over at the next meeting, considering NBC issue introduced at this meeting.    Rap: It should really be up to the proponent of the feature to provide a workable description, not to the LPP Rapporteur. Suggest deleting the NOTE (it's informative anyhow). |
| Ericsson | 6.4.3 | E601 | Regarding the field elevationList-r17 of the IE NR-TRP-BeamAntennaInfoPerTRP-r17  elevationList-r17 SEQUENCE (SIZE(1..1801)) OF ElevationElement-R17,  The range is up to 1801. It is unclear if it has to be up to 1801 or it was a typo.  Rap: See R2-2206326, row 73. |
| Ericsson | 6.4.3 | E602 | The field name scheduledLocationRequest-r17 of IE A-GNSS-ProvideCapabilities  The name scheduledLocationRequest-r17 is misleading while providing capability; this should be termed scheduledLocationRequestSupported-r17  Rap: See R2-2206326, row 89. |
| Ericsson | 6.4.3 | E603/E604 | This issue is further described in R2-2205813.  Add associated-DL-PRS-ID-r17 to NR-TRP-BeamAntennaInfoPerTRP  NR-TRP-BeamAntennaInfoPerTRP-r17 ::= SEQUENCE {  dl-PRS-ID-r17 INTEGER (0..255),  nr-PhysCellID-r17 NR-PhysCellID-r16 OPTIONAL, -- Need ON  nr-CellGlobalID-r17 NCGI-r15 OPTIONAL, -- Need ON  nr-ARFCN-r17 ARFCN-ValueNR-r15 OPTIONAL, -- Need ON  associated-DL-PRS-ID-r17 INTEGER (0..255) OPTIONAL, -- Need OP  lcs-GCS-TranslationParameter-r17 LCS-GCS-TranslationParameter-r16 OPTIONAL, -- Need OP  nr-TRP-BeamAntennaAngles-r17 NR-TRP-BeamAntennaAngles-r17,  ...  }    With the following field description  ***associated-DL-PRS-ID***  *This field specifies the dl-PRS-ID of the associated TRP from which the beam antenna information and parameters for LCS to GCS translation are adopted. If the field is omitted, the beam antenna information is provided via the nr-TRP-BeamAntennaAngles field and the LCS to GCS translation parameter is provided via the lcs-GCS-TranslationParameter. If the field is present, the field nr-TRP-BeamAntennaAngles shall be absent.*  and adjustment of field description:  ***nr-TRP-BeamAntennaAngles***  This field provides the relative power between DL-PRS Resources per angle per TRP. If this field is absent and the field *associated-DL-PRS-ID* is present, the *nr-TRP-BeamAntennaAngles* for this TRP are obtained from the *nr-TRP-BeamAntennaAngles of the associated TRP.*  Rap: See R2-2206326, row 70/71. |
| Ericsson | 6.4.3 | E603/E604 | This issue is further described in R2-2205813.  There was an incorrect correction earlier that has been overlooked regarding the associated-DL-PRS-ID of the NR-DL-PRS-BeamInfoPerTRP-r16  It shall be possible to configure a TRP-specific antenna orientation via the GCS-LCS-transformation also when there is an association to a TRP ID  Therefore, the field descriptions of PRS-BeamInfoPerTRP-r16 shall be changed into:  ***associated-DL-PRS-ID***  This field specifies the *dl-PRS-ID* of the associated TRP from which the beam information and parameters for LCS to GCS translation are adopted. If the field is omitted, the beam information is provided via the *dl-prs-BeamInfoSet* field and the LCS to GCS translation parameter is provided via the *lcs-GCS-TranslationParameter*. If the field is present, the field *dl-PRS-BeamInfoSet* shall be absent.  ***lcs-GCS-TranslationParameter***  This field provides the angles α (bearing angle), β (downtilt angle) and γ (slant angle) for the translation of a Local Coordinate System (LCS) to a Global Coordinate System (GCS) as defined in TR 38.901 [44]. If this field is absent, the *dl-PRS-Azimuth* and *dl-PRS-Elevation* are provided in a GCS.  ***dl-PRS-BeamInfoSet***  This field provides the DL-PRS beam information for each DL-PRS Resource of the DL-PRS Resource Set associated with this TRP. If this field is absent and the field *associated-DL-PRS-ID* is present, the *dl-PRS-BeamInfoSet* for this TRP are obtained from the *dl-PRS-BeamInfoSet* of the associated TRP.  Rap: Rel-16 change (probably not backwards compatible); requires separate discussion. |
| Fraunhofer | 6.4.3  – Area-ID-CellList |  | Regarding CATT's comment about removing Area-ID-CellList because the serving cell happens not to transmit DL-PRS: The serving cell does not have to be a reference TRP. A UE reports dl-PRS-ReferenceInfo-r16 in NR-DL-TDOA-SignalMeasurementInformation-r16, which means the UE can select a Reference resource (and thus also reference TRP). The concern about backward compatibility issues is not justified.  We have already taken several meetings to align on validity area, and came to a stable signaling mechanism already in the last meeting. Therefore, we propose to focus discussion on the more relevant aspects, and not amend something that is not broken.  Regarding the area-id IE inside the Area-ID-CellList, we see that the area-ID would have advantage for AD management when the IEs are transmitted over posSib. That’s why we are in favor of keeping the existing version. However, we also understand that we did not agree on further enhancements (such as posSib) that could make use of the area-ID. Hence, if we are the only ones against removing the IE area-id inside Area-ID-CellList, then we will compromise for progress (*i.e.* agree to Rapporteurs version).  Rap: What is the required correction? |

Summary:

Rapporteur comments are added directly in the Table rows above using Turquoise highlighting.

Corresponding changes are made in "Update\_of\_R2-2206328\_(draft CR 37355 LPP Updates)\_v01.docx":

- OPTIONAL removed from nr-los-nlos-indicator CHOICE in NR-DL-PRS-ExpectedLOS-NLOS-AssistancePerTRP.

- Cond statements for measurement instances added.

- Deleted the NOTE in IE *AreaID-CellList.*

The following additional changes were made in "Update\_of\_R2-2206328\_(draft CR 37355 LPP Updates)\_v01.docx":

From [AT118-e][631][POS]:

Implemented H032: beamInfoSup is removed from nr-PosCalcAssistanceSupport-r17 (and consequently, from the nr-PosCalcAssistanceRequest-r17) for DL-TDOA

Implemented H033: losNlosInfoSup is removed from nr-PosCalcAssistanceSupport-r17 for DL-TDOA and DL-AoD.

Implemented H046: trpTEG-InfoSup is removed from nr-PosCalcAssistanceSupport-r17 (and consequently, from the nr-PosCalcAssistanceRequest-r17) for DL-AoD

From [AT118-e][626][POS]:

The TEG margins (as requested by RAN4 (R2-2204139) are not added yet.

# 3. Phase 2 Discussion

Please provide your comments on "**Update\_of\_R2-2206328\_(draft CR 37355 LPP Updates)\_v01.docx**" located in the same folder as this discussion document in the Table below.

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| Company | LPP Section / IE | RIL# (if applicable) | Comments |
| Ericsson | area-Validity field description (6.5.10.6,6.5.11.6,6.5.12.6) |  | ***area-validity*** indicates that the target device supports pre-configured assistance data with area validity. The integer number indicates the maximum number of areas the target device supports*.*  Rap: Fixed in \_v2 |
| Ericsson | 6.4.3 | E603/E604 | The is now added as the beaminfo was (incorrectly) changed to. Thereby, we have the same flaw here as well – we cannot use the *lcs-GCS-TranslationParameter* together with the *associated-DL-PRS-ID*,which we need to be able to do to get the full benefits and size reduction.  We should have the following field description:  ***associated-DL-PRS-ID***  *This field specifies the dl-PRS-ID of the associated TRP from which the beam antenna information and parameters for LCS to GCS translation are adopted. If the field is omitted, the beam antenna information is provided via the nr-TRP-BeamAntennaAngles field and the LCS to GCS translation parameter is provided via the lcs-GCS-TranslationParameter. If the field is present, the field nr-TRP-BeamAntennaAngles shall be absent.*  and adjustment of field description:  ***nr-TRP-BeamAntennaAngles***  This field provides the relative power between DL-PRS Resources per angle per TRP. If this field is absent and the field *associated-DL-PRS-ID* is present, the *nr-TRP-BeamAntennaAngles* for this TRP are obtained from the *nr-TRP-BeamAntennaAngles of the associated TRP* |
| Ericsson | 6.4.3 | E603/E604 | We need to sort the same issue out for the beam info as well. I can see that there seems to be a backward compatibility issue. That can either be solved by a new IE for the *lcs-GCS-TranslationParameter* (not so nice) or a capability so that the server can determine if the device supports the combo *lcs-GCS-TranslationParameter* and *associated-DL-PRS-ID* or not, and only provide both for devices that indicates this capability. |
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