**3GPP TSG RAN WG1 #108 R1-2202519**

**e-Meeting, February 21st – March 3rd, 2022**

**Source: Moderator (Intel Corporation)**

**Title: Summary of the e-mail discussion [108-e-R16-Pos-02] on Rel.16 NR positioning maintenance**

**Agenda item: 7.2.8**

**Document for:**  **Discussion and Decision**

# Introduction

This document provides summary of the following RAN1 e-mail discussion

[108-e-R16-Pos-02] Email discussion/approval on editorial changes to be recommended to the specification editors on aspects 1, 2 and 4 in R1-2202519 by February 25 – Alexey (Intel)

# Discussion Aspects and Text Proposals

## Aspect #1: Descriptions of dl-PRS-ID

In [1], it is proposed to make a correction to reflect that *dl-PRS-ID* (or a TRP) is not always associated with multiple DL PRS resource sets, as the number of DL PRS resource sets of a TRP can be 1 in some cases. It is proposed to resolve this in the same way as it was done in TS-37.355 by using the following descriptions marked in yellow.

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| ***dl-PRS-ID***  This field is used along with a DL-PRS Resource Set ID and a DL-PRS Resources ID to uniquely identify a DL-PRS Resource. This ID can be associated with multiple DL-PRS Resource Sets associated with a single TRP. Each TRP should only be associated with one such ID. |

The following TP is provided to resolve minor inconsistency discussed in aspect #1:

**Text Proposal #1**

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| --- |
| **TS 38.214, section 5.1.6.5**  < Unchanged parts are omitted >  The UE expects that it will be configured with *dl-PRS-ID* each of which is defined such that it ~~is~~ can be associated with multiple DL PRS resource sets. The UE expects that one of these *dl-PRS-ID* along with a *nr-DL-PRS-ResourceSetID* and a *nr-DL-PRS-ResourceID-r16* can be used to uniquely identify a DL PRS resource.  < Unchanged parts are omitted > |

### Round #1

**Proposal #1**

Recommend text proposal #1 for implementation by specification editor

Comments from companies:

|  |  |
| --- | --- |
| Company Name | Comments |
| Huawei, HiSilicon | OK. |
| Nokia/NSB | Non-essential as LPP is clear already. Don’t support. |
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## Aspect #2: Descriptions of dl-PRS-CombSizeN-AndReOffset

In [1] it is proposed to make a correction to align a description related to *dl-PRS-CombSizeN-AndReOffset* in TS38.214 and 37.355.

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| A DL PRS resource is defined by:  *…*  *- dl-PRS-CombSizeN-AndReOffset* defines the starting RE offset of the first symbol within a DL PRS resource in frequency. The relative RE offsets of the remaining symbols within a DL PRS resource are defined based on the initial offset and the rule described in Clause 7.4.1.7.3 of [4, TS 38.211].  *…* |

It is found that the description of this parameter in TS38.214 is not aligned with the description in 37.355 and incomplete, since this parameter should not only specify REOffset, but also CombSizeN.

|  |
| --- |
| NR-DL-PRS-Resource-r16 ::= SEQUENCE {  nr-DL-PRS-ResourceID-r16 NR-DL-PRS-ResourceID-r16,  dl-PRS-SequenceID-r16 INTEGER (0.. 4095),  dl-PRS-CombSizeN-AndReOffset-r16 CHOICE {  n2-r16 INTEGER (0..1),  n4-r16 INTEGER (0..3),  n6-r16 INTEGER (0..5),  n12-r16 INTEGER (0..11),  ...  },  dl-PRS-ResourceSlotOffset-r16 INTEGER (0..nrMaxResourceOffsetValue-1-r16),  dl-PRS-ResourceSymbolOffset-r16 INTEGER (0..12),  dl-PRS-QCL-Info-r16 DL-PRS-QCL-Info-r16 OPTIONAL, --Need ON  ...  } |
| ***dl-PRS-CombSizeN-AndReOffset***  This field specifies the Resource Element spacing in each symbol of the DL-PRS Resource and the Resource Element (RE) offset in the frequency domain for the first symbol in a DL-PRS Resource. All DL-PRS Resource Sets belonging to the same Positioning Frequency Layer have the same value of comb size. The relative RE offsets of following symbols are defined relative to the RE Offset in the frequency domain of the first symbol in the DL-PRS Resource according to TS 38.211 [41]. The comb size configuration should be aligned with the comb size configuration for the frequency layer. |

The following TP is proposed to align description of parameter in TS 38.214 and TS 37.355

**Text Proposal #2**

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| --- |
| **TS 38.214, section 5.1.6.5**  < Unchanged parts are omitted >  A DL PRS resource is defined by:  *…*  *- dl-PRS-CombSizeN-AndReOffset* defines the comb size of a DL-PRS Resource and the starting RE offset of the first symbol within ~~a~~the DL PRS resource in frequency. The relative RE offsets of the remaining symbols within a DL PRS resource are defined based on the initial offset and the rule described in Clause 7.4.1.7.3 of [4, TS 38.211].  *…*  < Unchanged parts are omitted > |

### Round #1

**Proposal #2**

Recommend text proposal #2 for implementation by specification editor

Comments from companies:

|  |  |
| --- | --- |
| Company Name | Comments |
| Huawei, HiSilicon | Not needed. The comb size according to RAN1 specification should be defined by the parameter *dl-PRS-CombSizeN*, and on top of it, *dl-PRS-CombSizeN-AndReOffset* only provides the comb offset from RAN1 perspective.  *- dl-PRS-CombSizeN* defines the comb size of a DL PRS resource where the allowable values are given in Clause 7.4.1.7.3 of [TS38.211]. All DL PRS resource sets belonging to the same positioning frequency layer have the same value of *dl-PRS-CombSizeN*. |
| Nokia/NSB | Non-essential and don’t support. |
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## Aspect #4: Correction to expected RSTD

In [4], it is observed that specification (TS 38.214) is not clear how the difference is defined for parameters “expected RSTD” in the assistance data. It is proposed to clarify that parameter in the assistance data is defined between the target DL PRS and the assistance data reference.

The following TP is proposed to address described isssue.

**Text proposal #3**

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| **TS 38.214 section 5.1.6.5**5.1.6.5 PRS reception procedure ========================= Unchanged parts =========================  The UE may be configured to report quality metrics *NR-TimingQuality* corresponding to the DL RSTD and UE Rx-Tx time difference measurements which include the following fields:  *- timingQualityValue* which provides the best estimate of the uncertainty of the measurement  *- timingQualityResolution* which specifies the resolution levels used in the *timingQualityValue* field.  The UE expects to be configured with higher layer parameter *nr-DL-PRS-ExpectedRSTD*, which defines the time difference for the target DL PRS with respect to the received DL subframe timing of the reference indicated by the higher layer parameter *nr-DL-PRS-ReferenceInfo*, and *nr-DL-PRS-ExpectedRSTD-Uncertainty*, which defines a search window around the *nr-DL-PRS-ExpectedRSTD*.  For DL UE positioning measurement reporting in higher layer parameters *NR-DL-TDOA-SignalMeasurementInformation* or *NR-Multi-RTT-SignalMeasurementInformation* the UE can be configured to report the DL PRS resource ID(s) or the DL PRS resource set ID(s) associated with the DL PRS resource(s) or the DL PRS resource set(s) which are used in determining the UE measurements DL RSTD, or UE Rx-Tx time difference, respectively.  ========================= Unchanged parts ========================= |

### Round #1

**Proposal #3**

Recommend text proposal #3 for implementation by specification editor

Comments from companies:

|  |  |
| --- | --- |
| Company Name | Comments |
| Huawei, HiSilicon | OK |
| Nokia/NSB | Non-essential and don’t support. LPP spec is already clear and 214 does not need to word for word follow it. |
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Conclusions

In this document, the summary of the following RAN1 e-mail discussion is provided:

[108-e-R16-Pos-02] Email discussion/approval on editorial changes to be recommended to the specification editors on aspects 1, 2 and 4 in R1-2202519 by February 25 – Alexey (Intel)

References

1. [R1-2201077](D:\\Documents\\3GPP documents\\RAN1\\TSGR1_108-e\\Docs\\R1-2201077.zip) Maintenance on Rel-16 NR positioning vivo

1. [R1-2202267](D:\\Documents\\3GPP documents\\RAN1\\TSGR1_108-e\\Docs\\R1-2202267.zip) Draft CR on reference point for UL SRS-RSRP CATT

1. [R1-2202453](D:\\Documents\\3GPP documents\\RAN1\\TSGR1_108-e\\Docs\\R1-2202453.zip) Correction to UL SRS-RSRP Huawei, HiSilicon
2. [R1-2202420](file:///D:\Documents\3GPP%20documents\RAN1\TSGR1_108-e\Docs\R1-2202420.zip) Correction to expected RSTD Huawei, HiSilicon