**3GPP TSG RAN WG1 #107-e R1-21nnnnn**

**e-Meeting, November 11th – 19th, 2021**

**Source: Moderator (CATT)**

**Title: Summary on email discussion [107-e-NR-Pos-05] for the UE report of parameter NR-TimeStamp**

**Agenda item: 7.2.8**

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

Introduction

This contribution summarizes the discussions and outcomes of email discussion [107-e-NR-Pos-05] triggered by the following Chair’s decision:

[107-e-NR-Pos-05] Email discussion/approval on the UE report of parameter *NR-TimeStamp* (Aspect #5) until November 17 – Xiaotao (CATT)

Discussion

UE report of parameter NR-TimeStamp

**Background**

In the draft CR for TS 38.214(R1-2111220) [1], it is proposed that there is misalignment between TS 37.355 [2] and TS 38.214 [3] on whether the parameters ‘*dl-PRS-ID-r16*’ and ‘*NR-TimeStamp*’ have to be reported in the UE measurement report.

As shown in the following descriptions in TS 37.355 (section 6.4.3), the TRP ID, i.e. ‘*dl-PRS-ID-r16*’, has to be reported in the *NR-TimeStamp-r16*.

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| --- |
| -- ASN1START  NR-TimeStamp-r16 ::= SEQUENCE {  dl-PRS-ID-r16 INTEGER (0..255),  nr-PhysCellID-r16 NR-PhysCellID-r16 OPTIONAL, -- Need ON  nr-CellGlobalID-r16 NCGI-r15 OPTIONAL, -- Need ON  nr-ARFCN-r16 ARFCN-ValueNR-r15 OPTIONAL, -- Need ON  nr-SFN-r16 INTEGER (0..1023),  nr-Slot-r16 CHOICE {  scs15-r16 INTEGER (0..9),  scs30-r16 INTEGER (0..19),  scs60-r16 INTEGER (0..39),  scs120-r16 INTEGER (0..79)  },  ...  }  -- ASN1STOP |

In addition, according to the descriptions in TS 37.355, for DL-TDOA, DL-AoD and Multi-RTT positioning, the parameter ‘*NR-TimeStamp-r16*’ also has to be reported. For example, in section 6.5.11.4 of TS37.355, the measurements for DL-AoD are shown as follows:

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| -- ASN1START  NR-DL-AoD-SignalMeasurementInformation-r16 ::= SEQUENCE {  nr-DL-AoD-MeasList-r16 NR-DL-AoD-MeasList-r16,  ...  }  NR-DL-AoD-MeasList-r16 ::= SEQUENCE (SIZE(1..nrMaxTRPs-r16)) OF NR-DL-AoD-MeasElement-r16  NR-DL-AoD-MeasElement-r16 ::= SEQUENCE {  dl-PRS-ID-r16 INTEGER (0..255),  nr-PhysCellID-r16 NR-PhysCellID-r16 OPTIONAL,  nr-CellGlobalID-r16 NCGI-r15 OPTIONAL,  nr-ARFCN-r16 ARFCN-ValueNR-r15 OPTIONAL,  nr-DL-PRS-ResourceID-r16 NR-DL-PRS-ResourceID-r16 OPTIONAL,  nr-DL-PRS-ResourceSetID-r16 NR-DL-PRS-ResourceSetID-r16 OPTIONAL,  nr-TimeStamp-r16 NR-TimeStamp-r16,  nr-DL-PRS-RSRP-Result-r16 INTEGER (0..126),  nr-DL-PRS-RxBeamIndex-r16 INTEGER (1..8) OPTIONAL,  nr-DL-AoD-AdditionalMeasurements-r16  NR-DL-AoD-AdditionalMeasurements-r16 OPTIONAL,  ...  }  NR-DL-AoD-AdditionalMeasurements-r16 ::= SEQUENCE (SIZE (1..7)) OF  NR-DL-AoD-AdditionalMeasurementElement-r16  NR-DL-AoD-AdditionalMeasurementElement-r16 ::= SEQUENCE {  nr-DL-PRS-ResourceID-r16 NR-DL-PRS-ResourceID-r16 OPTIONAL,  nr-DL-PRS-ResourceSetID-r16 NR-DL-PRS-ResourceSetID-r16 OPTIONAL,  nr-TimeStamp-r16 NR-TimeStamp-r16,  nr-DL-PRS-RSRP-ResultDiff-r16 INTEGER (0..30),  nr-DL-PRS-RxBeamIndex-r16 INTEGER (1..8) OPTIONAL,  ...  }  -- ASN1STOP |

However, as described in TS 38.214 in the following paragraph in section 5.1.6.5., either ‘*dl-PRS-ID-r16*’ or ‘*NR-TimeStamp-r16*’ seems to be an optional parameter in the measurement report.

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| 5.1.6.5 PRS reception procedure [TS 38.214]  < Uncorrelated parts are omitted >  For the DL RSTD, DL PRS-RSRP, and UE Rx-Tx time difference measurements the UE can report an associated higher layer parameter *nr-TimeStamp*. The *nr-TimeStamp* can include the *dl-PRS-ID*, the SFN and the slot number for a subcarrier spacing. These values correspond to the reference which is provided by *nr-DL-PRS-ReferenceInfo*.  < Uncorrelated parts are omitted > |

Therefore, there is misalignment between TS 37.355 and TS 38.214 on whether the parameters ‘*dl-PRS-ID-r16*’ and ‘*NR-TimeStamp-r16*’ have to be reported in the measurement report.

***Issue 1: there is misalignment between TS 38.214 and TS 37.355.***

* ***In TS 37.355, both ‘dl-PRS-ID-r16’ and ‘NR-TimeStamp-r16’ are mandated to be reported.***
* ***In TS 38.214, either ‘dl-PRS-ID-r16’ or ‘NR-TimeStamp-r16’ is optional parameter in the measurement report.***

**Proposed change**

Considering the usage of these parameters, we propose to remove the words ‘can’ in TS 38.214 in order to be aligned with TS 37.355. In this way, ‘*NR-TimeStamp-r16*’ and its associated parameter ‘*dl-PRS-ID-r16*’ have to be reported.

The following text proposal is prepared to address raised above issue:

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| 5.1.6.5 PRS reception procedure < Unchanged parts are omitted > For the DL RSTD, DL PRS-RSRP, and UE Rx-Tx time difference measurements the UE reports an associated higher layer parameter *nr-TimeStamp*. The *nr-TimeStamp* includes the *dl-PRS-ID*, the SFN and the slot number for a subcarrier spacing. These values correspond to the reference which is provided by *nr-DL-PRS-ReferenceInfo*. < Unchanged parts are omitted > |

Discussion Round #1

Companies are invited to provide views on the following question for the text proposal above.

### Question 1

* Which option do you prefer to handle the text proposal proposed above?
  + Alt.1 Agree to the draft CR.
  + Alt.2 Endorse the draft CR and include the change in the editor alignment CR.
  + Alt.3 The change is not needed.

|  |  |  |
| --- | --- | --- |
| Company Name | Alt | Comments |
| Nokia/NSB | Alt 3 | This change is non-essential and the current spec is clear in our view. If you read 214 it says the UE can report this IE. Then if a reader looks at LPP it is clear that the UE has to report this IE as part of the measurement report. We don’t see how the spec could be misinterpreted. |
| CATT | Alt.1 | To Nokia/NSB:  This CR does correct the errors in the TS 38.214. Since UE is expected to mandatory report these two parameters, but according to 214, UE may not report these two parameters, then LMF cannot obtain the necessary parameters, and the system may be broken. Therefore, this CR should be an essential CR. |
| Huawei, HiSilicon | Alt.3 | “May” in the spec means “permission”, instead of “possibility” according to Annex E of TR 21.901. So UE is permitted to report the time stamp, which does not conflict with the LPP specification.  “May do something” should not be interpreted only as “being possible of not doing that thing” in the spec. |
| CATT-2 | Alt.1 | To Huawei, HiSilicon:  In the proposed CR, we want to delete the word of “can” instead of “May”. In addition, about the TR 21.901, it seems that the TR number is not correct. |
| ZTE |  | Ok to support Alt.2. We can also accept Alt.3 as commented by Huawei/Nokia. |
| QC | Alt. 3 |  |

Discussion Round #2

During the discussion Round #1, 3 companies think this change is not needed, and 1 company prefers to agree to the draft CR, and 1 company prefers to endorse the draft CR and include the change in the editor alignment CR. The views of various companies are divergent.

According to the following Table E.4 in Annex E in TR21.801, “can” refers to possibility and capability. Therefore, “can” in the above draft CR for TS 38.214 means “there is a possibility of”, which is misaligned with TS 37.355.

**Table E.4: Possibility and capability**

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| --- | --- |
| Verbal form | Equivalent expressions for use in exceptional cases  (see clause 6.6.1) |
| **can** | be able to  there is a possibility of  it is possible to |
| **cannot** | be unable to  there is no possibility of  it is not possible to |
| Do not use "may" instead of "can" in this context. Do not use "may not" in this context.  NOTE: "May" signifies permission expressed by the standard, whereas "can" refers to the ability of a user of the standard or to a possibility open to him. If there is uncertainty about whether an event will or will not happen, in particular where the normally expected behaviour will sometimes be impossible, a formulation such as "cannot always" should be used. | |

Based on the above explanation of the word “can” in TR21.801, the moderator tends to include the change in the editor alignment CR.

Companies are invited to provide views on the following proposal for the text proposal above.

### Proposal 1

* Endorse the draft CR and include the change in the editor alignment CR.

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| Company Name | Comments |
| Nokia/NSB | We still don’t feel that the change is needed. |
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Conclusion

TBD

Reference

1. R1-2111220, “Draft CR on the parameter NR-TimeStamp for Rel-16 Positioning”, CATT.
2. TS 37.355, “LTE Positioning Protocol (LPP) (Release 16)”, V16.6.0 (2021-09).
3. TS 38.214, “NR; Physical layer procedures for data (Release 16)”, V16.7.0 (2021-09).