**3GPP TSG RAN WG1 Meeting #104-E R1-210zzzz**

**e-Meeting, January 25th – February 5th, 2021**

**Source: Moderator (Intel Corporation)**

**Title:** **Summary E-mail Discussion [104e-NR-Pos-01]**

**Agenda item: 7.2.8**

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

Introduction

In this document, we provide summary and outcome of the RAN WG1 e-mail discussion [104e-NR-Pos-01] organized based on review of submitted contributions [1]-[8] as captured in [TBD].

# Overview of Remaining Opens

## Change of Cell on DL PRS ID (TP#1 and TP#2)

In [CATT, [3]] it is pointed out that there is no higher layer parameter to indicate the serving or non-serving cell for DL-PRS in the activation command. According to description in section 6.1.3.36 of the TS 38.321, the *DL-PRS ID* field is used to indicate the DL-PRS resource, when a UE receives an activation command of semi-persistent *SRS-Pos*. The following changes are suggested in text proposal provided below:

**Text proposal #1**

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| 6.2.1 UE sounding procedure *-----------------------------------------------------* Unchanged part omitted *------------------------------------------------*  For a UE configured with one or more SRS resource configuration(s), and when the higher layer parameter *resourceType* in *SRS-Resource* or *SRS-PosResource-r16* is set to 'semi-persistent':  - when a UE receives an activation command, as described in clause 6.1.3.17 or 6.1.3.36 of [10, TS 38.321], for an SRS resource, and when the UE would transmit a PUCCH with HARQ-ACK information in slot *n* corresponding to the PDSCH carrying the activation command is transmitted in slot n, the corresponding actions in [10, TS 38.321] and the UE assumptions on SRS transmission corresponding to the configured SRS resource set shall be applied starting from the first slot that is after slot where ** is the SCS configuration for the PUCCH. The activation command also contains spatial relation assumptions provided by a list of references to reference signal IDs, one per element of the activated SRS resource set. When the SRS is configured with the higher layer parameter *SRS-ResourceSet*, each ID in the list refers to a reference SS/PBCH block, NZP CSI-RS resource configured on serving cell indicated by *Resource Serving Cell ID* field in the activation command if present, same serving cell as the SRS resource set otherwise, or SRS resource configured on serving cell and uplink bandwidth part indicated by Resource *Serving Cell ID* field and *Resource BWP ID* field in the activation command if present, same serving cell and bandwidth part as the SRS resource set otherwise. When the SRS is configured with the higher layer parameter *SRS-PosResourceSet-r16*, each ID in the list of reference signal IDs may refer to a reference SS/PBCH block on a serving or non-serving cell indicated by *PCI* field in the activation command, NZP CSI-RS resource configured on serving cell indicated by *Resource Serving Cell ID* field in the activation command if present, same serving cell as the SRS resource set otherwise, ~~or~~ SRS resource configured on serving cell and uplink bandwidth part indicated by Resource *Serving Cell ID* field and *Resource BWP ID* field in the activation command if present, same serving cell and bandwidth part as the SRS resource set otherwise, or DL PRS resource associated with a *dl-PRS-ID* ~~of a serving or non-serving cell~~ indicated by *DL-PRS ID* field in the activation command if present, same serving cell as the SRS resource set otherwise ~~a higher layer parameter~~.  *-----------------------------------------------------* Unchanged part omitted *------------------------------------------------* |

**Text proposal #2**

In [Nokia, [5]], it is proposed to remove the term cell in the TS 38.214 Section “5.6.1.5 PRS reception procedure”. During RAN1#103-e some instances of this term were changed but others were missed.

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| ---- Unchanged texts omitted ---- 5.6.1.5 PRS reception procedure ---- Unchanged texts omitted ----  The UE expects that it will be configured with *dl-PRS-ID-r16* each of which is defined such that it may be associated with multiple DL PRS resource sets.  ---- Unchanged texts omitted ---- |

### Initial Round #0

Companies are invited to provide their views on text proposal(s) in section 2.1.

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| **Company Name** | **Comments** |
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## Misalignment of ‘*nr-TimeStamp*’ with TS37.355

In [vivo, [4]], the misalignment b/w RAN1 (TS 38.214) and RAN2 (TS 37.355) specifications is discussed with respect to *nr-TimeStamp* parameter. The values of the time stamp correspond to the reference provided by *nr-DL-PRS-ReferenceInfo*, which is associated with the reference TRP.In the TS37.355 [2], the descriptions are written as:

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| 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)  },  ...  } |
| ***dl-PRS-ID***  This field specifies the DL-PRS ID of the TRP for which the *nr-SFN* is applicable. |

It is observed that from RAN2’s perspective, the ‘*nr-TimeStamp*’ for each measurement is associated with the TRP indicated by ‘dl-PRS-ID’.

The following text proposal is provided for the TS 38.214 to align it with the TS 37.355.

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| **TS38.214-g40**  < Unchanged 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 SFN and the slot number for a subcarrier spacing. These values correspond to the *dl-PRS-ID* for which *nr-TimeStamp* is applicable ~~the reference which is provided by~~ *~~nr-DL-PRS-ReferenceInfo~~*~~.~~  < Unchanged parts are omitted > |

### Initial Round #0

Companies are invited to provide their views on text proposal(s) in section 2.2.

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| **Company Name** | **Comments** |
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## Ambiguity for Measurement Gap Request

In [vivo, [4]], it is noticed that according to the TS 38.331, for ‘measurement gap request’, the related higher layer parameter should be ‘*LocationMeasurementIndication*’.

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| * *LocationMeasurementIndication*   The *LocationMeasurementIndication* message is used to indicate that the UE is going to either start or stop location related measurement which requires measurement gaps.  Signalling radio bearer: SRB1  RLC-SAP: AM  Logical channel: DCCH  Direction: UE to Network  *LocationMeasurementIndication message*  -- ASN1START  -- TAG-LOCATIONMEASUREMENTINDICATION-START  LocationMeasurementIndication ::= SEQUENCE {  criticalExtensions CHOICE {  locationMeasurementIndication LocationMeasurementIndication-IEs,  criticalExtensionsFuture SEQUENCE {}  }  }  LocationMeasurementIndication-IEs ::= SEQUENCE {  measurementIndication SetupRelease {LocationMeasurementInfo},  lateNonCriticalExtension OCTET STRING OPTIONAL,  nonCriticalExtension SEQUENCE{} OPTIONAL  }  -- TAG-LOCATIONMEASUREMENTINDICATION-STOP  -- ASN1STOP |

The following TP is provided for the TS 38.214 to resolve ambiguity with respect to measurement gap request between specifications (TS 38.214 and TS 38.331).

**Text Proposal**

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| **TS 38.214-g40**  < Unchanged parts are omitted >  The UE is expected to measure the DL PRS resource outside the active DL BWP or with a numerology different from the numerology of the active DL BWP if the measurement is made during a configured measurement gap. When the UE is expected to measure the DL PRS resource outside the active DL BWP it may request a measurement gap ~~in~~ via higher layer parameter *LocationMeasurementIndication ~~MeasGapConfig~~* [12, TS 38.331].  < Unchanged parts are omitted > |

### Initial Round #0

Companies are invited to provide their views on text proposal(s) in section 2.3.

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| **Company Name** | **Comments** |
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## DL PRS Resource / Resource Set IDs Reporting for DL-AOD

For the UE performing measurement reporting, it can be configured to report related IDs as following [vivo, [4]].

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| 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, UE Rx-Tx time difference. |

In specification TS 37.355, the related IDs are also applicable to the DL-AOD method.

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| 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, -- Cond SameRx  nr-DL-AoD-AdditionalMeasurements-r16  NR-DL-AoD-AdditionalMeasurements-r16 OPTIONAL,  ...  } |

The following text proposal is suggested for the TS 38.214 to align it with the TS 37.355.

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| **TS 38.214-g40**  < Unchanged parts are omitted >  For DL UE positioning measurement reporting in higher layer parameters *NR-DL-TDOA-SignalMeasurementInformation* or *NR-Multi-RTT-SignalMeasurementInformation or NR-DL-AoD-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, UE Rx-Tx time difference, DL RSRP.  < Unchanged parts are omitted > |

### Initial Round #0

Companies are invited to provide their views on text proposal(s) in section 2.2.

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| **Company Name** | **Comments** |
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Conclusions

In this contribution, the summary of the RAN WG1 e-mail discussion: “[104-e-NR-Pos-01] Email discussion/approval on DL PRS” is provided. As an outcome the following was agreed by RAN WG1: TBD

References

1. R1-2100127 Text Proposals on NR Positioning OPPO
2. R1-2100282 Maintenance of NR positioning support ZTE
3. R1-2100342 Discussion and TP on remaining issues in NR positioning CATT
4. R1-2100419 Maintenance on Rel-16 NR positioning vivo
5. R1-2100552 Draft CR on the usage of the term cell Nokia, Nokia Shanghai Bell
6. R1-2100707 Editorial CR on Rel-16 NR positioning LG Electronics
7. R1-2101731 Corrections to positioning SRS and higher layer parameters Huawei, HiSilicon
8. R1-2101758 Maintenance of NR positioning support Ericsson
9. R1-2100005 LS on Rel-16 NR Positioning Correction RAN3, Huawei
10. R1-210zzzz TBD