3GPP TSG RAN WG2 Meeting #119-e Draft R2-220xxxx

**Electronic meeting, 17- 29 Aug, 2022**

**Agenda item:** 6.11.1

**Source:** Intel Corporation

**Title:** Report of [AT119-e][409][POS] Rel-17 positioning capabilities (Intel)

**Document for:**  Discussion and decision

# Introduction

This is the report of following offline discussion:

* [AT119-e][409][POS] Rel-17 positioning capabilities (Intel)

      Scope: Check and update the rapporteur CR in R2-2207385 to take account of decisions of this meeting.  Evaluate the proposals in the following tdocs:

* R2-2208492

      Intended outcome: Agreeable CR

      Deadline: Tuesday 2022-08-23 1200 UTC

I would like to split the discussion into two phases:

**Phase 1**: to provide your view on issues;     Deadline:  Saturday 2022-08-20 1800 UTC

**Phase 2**: To check TPs; Deadline:  Tuesday 2022-08-23 1200 UTC

Following stage 2 changes are discussed in the offline discussion:

R2-2207385 Corrections on LPP capabilies Intel Corporation

R2-2208492 Change request about UE capability for PRS measurement within a PPW vivo

# Annex: companies’ point of contact

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| **Company** | **Point of contact** | **Email address** |
| Intel Corporation | Yi Guo | Yi.guo@intel.com |
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# Discussion

## Changes from R2-2207385 Corrections on LPP capabilies Intel Corporation

***Reason for change:***

Based on RAN1 latest feature list in R1-2205607 and RAN4 R4-2211189, the Prerequisite feature groups and some clarifications for following LPP capabilities are missing:

27-1-1 nr-UE-RxTEG-ID-MaxSupport-r17

27-1-2/27-1-2a nr-UE-TxTEG-ID-MaxSupport-r17

27-1-3 nr-UE-RxTxTEG-ID-MaxSupport-r17

27-1-4 measureSameDL-PRS-ResourceWithDifferentRxTEGs-r17

27-1-4a measureSameDL-PRS-ResourceWithDifferentRxTEGsSimul-r17

27-2-1 maxDL-PRS-FirstPathRSRP-MeasPerTRP-r17 (in addition, restriction “The maximum number of first path PRS RSRP per TRP should be less than or equal to the maximum number of PRS RSRP (27-2-2)” should be added;)

27-2-2 maxDL-PRS-RSRP-MeasurementFR1-r17, maxDL-PRS-RSRP-MeasurementFR2-r17

27-3-1 supportedDL-PRS-ProcessingSamples (In addition, a note should be added as

Note: this feature is supported for both UE-assisted and UE based positioning

)

27-3-2

prs-ProcessingWindowType1A-r17

prs-ProcessingWindowType1B-r17

prs-ProcessingWindowType2-r17

(A note should be added as Note: Within a PRS processing window, UE measurement is inside the active DL BWP with PRS having the same numerology as the active DL BWP)

27-3-3 prs-ProcessingCapabilityOutsideMGinPPW (no change is needed)

27-4-1 nr-los-nlos-AssistanceDataSupport-r17 (in addition, a Note should be added as NOTE: A single value is reported when both Multi-RTT and DL-TDOA are supported.)

27-6 (no change is needed)

dl-PRS-BufferType-RRC-Inactive-r17

durationOfPRS-Processing-RRC-Inactive-r17

maxNumOfDL-PRS-ResProcessedPerSlot-RRC-Inactive-r17

27-7 (no change is needed)multiMeasInSameMeasReport-r17

27-8 nr-PosCalcAssistanceSupport-r17 (bit 3 DL-TDOA, bit 2 DL-AoD, )

27-9 (no change is needed) lowerRxBeamSweepingThan8-FR2-r17

27-10a mg-ActivationRequest-r17

27-12 nr-los-nlos-IndicatorSupport-r17(no change is needed)

27-13 additionalPathsExtSupport-r17(no change is needed)

27-13a supportOfDL-PRS-FirstPathRSRP-r17

27-14 additionalPathsExtSupport-r17(no change is needed)

27-14a supportOfDL-PRS-FirstPathRSRP-r17

27-15 posSRS-RRC-Inactive-InInitialUL-BWP-r17(no change is needed)

27-15b posSRS-RRC-Inactive-OutsideInitialUL-BWP-r17 (in addition, some notes should be added

Note 2: If component 9 is not signaled, the UE only supports same center frequency between the SRS for positioning and initial UL BWP

 Note 3: If component 5 is not signaled, the UE only supports same numerology between the SRS and the initial UL BWP

Note 4: If component 6 is not signaled, the UE supports only SRS BW that include the BW of the CORESET #0 and SSB.

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27-15a maxNumOfSemiPeristentSRSposResources-r17 maxNumOfSemiPersistentSRSposResourcesPerSlot-r17

27-15c maxNumOfSemiPeristentSRSposResources-r17 maxNumOfSemiPersistentSRSposResourcesPerSlot-r17

27-16a

 olpc-SRS-PosRRC-Inactive-r17

27-18a/27-18b/27-18c dl-PRS-MeasRRC-Inactive-r17

27-19a

spatialRelationsSRS-PosRRC-Inactive-r17

27-20 dl-PRS-ResourcePrioritySubset-Sup-r17 (no change is needed)

27-21 nr-DL-PRS-BeamInfoSup-r17(no change is needed)

27-22 nr-PosCalcAssistanceSupport-r17, beamInfoSup(no change is needed)

14-2 supportedDL-PRS-ProcessingSamples-RRC-Inactive-r17

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***Summary of change:***:

To add the Prerequisite feature groups for LPP capabilities introduced in Rel-17 and corresponding clarifications based on RAN1/RAN4 latest feature list in R1-2205607 and R4-2211189

***Consequences if not approved:***

It is unclear on how to set the LPP capabilities.

**Moderator’s comments**:

* It is to align with latest RAN1/4 feature lists;

 Moderator would like to check companies’ view:

**Discussion point 3.1: Do you agree the changes in R2-2207385?**

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| --- | --- | --- |
| **Company’s name** | **Yes or No?** | **Comments, if any** |
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## Changes from R2-2208492 Change request about UE capability for PRS measurement within a PPW vivo

***Reason for change:***

According to RAN4 LS R2-2206945, RAN2 needs to introduce the UE capability for support of Rx timing difference between the serving cell and non-serving cell for PRS measurement within a PPW in *NR-DL-PRS-ProcessingCapability* of TS 37.355. The capability type shall be per band.

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| * The applicability condition on Rx timing difference between the serving cell and a neighbor cell/TRP for PRS measurements within a PPW is $max \left|∆T\right|\leq THR$, where
	+ $∆T$ is the time difference between the start of a slot containing PRS from the neighbor cell/TRP and the start of the closest slot from the serving cell, , and
	+ the range of $∆T$ is determined by the expected RSTD and expected RSTD uncertainty in the assistance data.
	+ $THR$ is the threshold, which is up to UE capability (as already informed in R4-2206981)
* The candidate values for $THR$ include {CP length, ¼ symbol length, ½ symbol length, ½ slot length}
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***Summary of change:***:

Introduce a new UE capability for support of Rx timing difference between the serving cell and non-serving cell for PRS measurement within a PPW in *NR-DL-PRS-ProcessingCapability*;

***Consequences if not approved:***

Incomplete UE capability for PRS measurement.

**Moderator’s comments**:

The capability is indicated in RAN4 feature list as 14-3, and has been captured in RRC/306 based on latest RAN4 feature list. RAN4 did not agree to add this in LPP. Therefore I would suggest not to add it in LPP unless RAN4 requests us to do so.

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| 14. NR\_pos\_enh | 14-3 | PRS measurement without MG | Capability for the threshold used to be compared against with the Rx timing difference to determine whether the PRS from the non-serving cell satisfy the condition of PRS measurement outside MG. | 27-3-2 | yes |  |  | Per band | No | No | N/A | The candidate threshold values: CP length, 1/4 symbol, 1/2 symbol, half of slot |

 Moderator would like to check companies’ view:

**Discussion point 3.2: Do you agree the changes in R2-2208492?**

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| **Company’s name** | **Yes or No?** | **Comments, if any** |
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# Summary report and proposals

**For agreement:**

**Online discussion:**

# Reference

1. R2-2207385 Corrections on LPP capabilies Intel Corporation
2. R2-2208492 Change request about UE capability for PRS measurement within a PPW vivo