3GPP TSG RAN WG2 Meeting #117-e R2-220xxxx

**Electronic meeting, 21 Feb- 3 March, 2022**

**Agenda item:** 8.11.1

**Source:** Intel Corporation

**Title:** Report of  [AT117-e][632][POS] Merged CR to 38.305 (Intel)

**Document for:**  Discussion and decision

# Introduction

This is the report of following offline discussion:

* [AT117-e][632][POS] Merged CR to 38.305 (Intel)

      Scope: Merge the endorsed positioning CRs to 38.305.

      Intended outcome: Agreeable CR

      Deadline:  Wednesday 2022-03-02 1000 UTC

# Annex: companies’ point of contact

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| --- | --- | --- |
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| Huawei, HiSilicon |  |  |
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# Discussion

## Summary

### 3.1.1 RAT dependent positioning

**Additional changes:**

**On demand PRS:**

1 Add a Stage 2 note clarifying the difference between index-based and explicit-based on-demand PRS requests. (based on RAN2 aqgreements)

2 The UE-initiated mechanism is enabled by the UE request triggering a request from the LMF, and the actual PRS changes are requested by the LMF irrespective of whether the procedure is UE- or LMF-initiated. (based on comments received in RAN2#117-e604)

**TEG definition (capture RAN1 agreements):**

**“**

* A “Rx TEG” is associated with one or more measurements obtained from one or multiple received RS resources. The Rx timing error differences between any pair of the measurements belonging to the same Rx TEG are within a certain margin.
* A “Tx TEG” is associated with one or more transmitted RS resources.  The Tx timing error differences between any pair of the RS resources belonging to the same Tx TEG are within a certain margin.
* The “group” means that for a set of multiple measurements or a set of multiple RS resources, if the error difference between any pair within the set is within the margin, the set is intuitively considered as timing error group, and is associated with a TEG ID.
* The definitions of the *Tx/Rx timing delays/errors* and *Rx/Tx/RxTx TEGs* in RAN2’s LS that RAN2 plans on using as a baseline are correct with the following changes.
  + **UE RxTx ‘timing error group’ (UE RxTx TEG)**: Rx timing errors and Tx timing errors, associated with UE reporting of one or more UE Rx-Tx time difference measurements, which have the 'Rx timing errors+Tx timing errors' differences within a certain margin
  + **TRP RxTx ‘timing error group’ (TRP RxTx TEG)**: Rx timing errors and Tx timing errors, associated with TRP reporting of one or more gNB Rx-Tx time difference measurements, which have the 'Rx timing errors+Tx timing errors' differences within a certain margin

**”**

**Merged endorsed CR**

* [AT117-e][604][POS] RAT-dependent positioning running CR to 38.305 (Intel)

Scope: Review and update the CR in R2-2202490.

Intended outcome: Endorsable CR in R2-2203605

Deadline: Friday 2022-02-25 1000 UTC

[R2-2203605](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203605-Running%2038.305%20v04.docx) Running 38.305 CR for Positioning WI on RAT dependent positioning methods Intel Corporation draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Endorsed

### 3.1.2 GNSS integrity

**Merged endorsed CR**

[R2-2203604](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203604%20(Running%20CR%20of%2038_305%20GNSS%20Pos%20Integrity).docx) Running CR of 38.305 for GNSS Positioning Integrity InterDigital, Inc. draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Endorsed
* [AT117-e][603][POS] Integrity stage 2 CRs (InterDigital)

Scope: Review and update the following CRs:

* R2-2202861 (integrity introduction to 36.305)
* R2-2202862 (integrity introduction to 38.305)

Intended outcome: Endorsable CRs

Deadline: Friday 2022-02-25 1000 UTC

### 3.1.3 A-GNSS enhancements

**Merged endorsed CRs**

[R2-2203611](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\38.305_CR0084r1_(Rel-17)_R2-2203611.docx) Introduction of B2a and B3I signal in BDS system in A-GNSS CATT, CAICT, CMCC, China Telecom, China Unicom, Huawei, HiSilicon, Intel Corporation, ZTE Corporation, CBN, vivo, OPPO, Lenovo, MediaTek Inc, Spreadtrum Communications, Xiaomi. CR Rel-17 38.305 16.7.0 0084 1 B NR\_pos\_enh-Core R2-2109485

* Endorsed
* [AT117-e][601][POS] BDS running CRs (CATT)

Scope: Review the following CRs, collect comments, and update if necessary:

* R2-2202402 (BDS introduction to 37.355)
* R2-2202403 (BDS introduction to 36.305)
* R2-2202404 (BDS introduction to 38.305)

Intended outcome: Endorsable CRs and report in R2-2203612

Deadline: Friday 2022-02-25 1000 UTC

[R2-2203615](file:///C:\Users\mtk16923\Documents\3GPP%20Meetings\202202-03%20-%20RAN2_117-e,%20Online\Extracts\R2-2203615%20Draft%20running%20CR%20for%20stage2%20spec%20for%20NAVIC%20in%20R17%20positioning.docx) Draft running CR for stage2 spec for NAVIC in R17 positioning Huawei, HiSilicon draftCR Rel-17 38.305 16.7.0 B NR\_pos\_enh-Core

* Endorsed
* [AT117-e][602][POS] NavIC running CRs (Ericsson/Huawei)

Scope: Review the following CRs, collect comments, and update if necessary:

* R2-2202607 (NavIC introduction to 38.305)
* R2-2203710 (NavIC introduction to 38.331)

Intended outcome: Endorsable CRs and report in R2-2203608

Deadline: Friday 2022-02-25 1000 UTC

## 3.2 Comments on the merged CR

**Discussion point : Companies are invited to provide view on the merged version?**

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| **Company’s name** | **Section** | **Identified issues** | **Change suggestion** |
| Nokia | 3.1 | Minor editorial issue in **Rx Timing Error** definition | Remove “(defined below)” in the first sentence.  [Rapp] Thanks, done. |
| Nokia | 7.x.1 | The last sentence starts as a sentence specific to UE-initiated case but ends in making a statement for both UE-initiated and LMF-initiated cases. | Adopt one of the following suggested sentences to replace the last sentence in 7.x.1:  **Option 1**: “The UE-initiated mechanism is enabled by the UE request triggering a request from the LMF, and the actual PRS changes are requested by the LMF”  **Option 2**: “The actual PRS changes are requested by the LMF irrespective of whether the procedure is UE- or LMF-initiated”  [Rapp] Thanks, I updated based on option 2. |
| Nokia | 7.y.2 | Editorial issue in step 1. Similar issue in step 1 in section 7.z.2 | MEASUREMENT PRECONFIGURATION REQUIRE should be MEASUREMENT PRECONFIGURATION REQUIRED  [Rapp] Thanks, done. |
| Nokia | 7.x.2 | NOTE 2 needs alignment of terminology | In the first sentence change  From: “the UE is allowed to request On-Demand PRS parameters based on preconfigured PRS configuration ID (index-based request)”  To: “the UE is allowed to request On-Demand PRS parameters based on pre-defined PRS configuration ID (index-based request)”  [Rapp] Thanks, done. |
| Swift Navigation | 8.1.1a | In Equation 8.1.1a we need to clarify that the error can exceed the bound for up to the TTA without being considered a violation. This is consistent with the existing descriptions in section 8.1.1a (i.e. the ‘grace period’) and the principles introduced in the SI (TR 38.387, Sections 9.1.1.3, 9.1.1.4). Note: this update does not change the current agreement that the group has made about *not* sending the AL and TTA KPIs in LPP, as Equation 8.1.1a-1 refers to the assistance data rather than the Integrity Request / Results. | For integrity operation, the network will ensure that:  *P(Error > Bound* for longer than TTA *| NOT DNU) <= Residual Risk + IRallocation* **(Equation 8.1.1a-1)**  …  where:  **Time-to-Alert (TTA):** The maximum allowable elapsed time from when the Error exceeds the Bound until a DNU flag must be issued.  [Rapp] Thanks, Updated. |
| Swift Navigation | 8.1.1a | Update Stage 2 following the agreements that have been made in the LPP Running CR regarding the RealTimeIntegrity IE and DNU=FALSE condition. | Equation 8.1.1a-1 holds at any epochs for which Assistance Data is provided. Providing Assistance Data without the Integrity Service Alert IE or Real Time Integrity IEs is interpreted as a DNU=FALSE condition. For any bound that is still valid (within its validity time), the network ensures that the Integrity Service Alert and/or Real Time Integrity IEs are also included in the provided Assistance Data if needed to satisfy the condition in Equation 8.1.1a-1. It is up to the implementation how to handle epochs for which integrity results are desired but there are no DNU flag(s) available, e.g. the Time To Alert (TTA) may be set such that there is a “grace period” to receive the next set of DNU flags.  Only those satellites for which the GNSS integrity assistance data are provided are monitored by the network and can be used for integrity related applications.  [Rapp] Thanks, Updated. |
| Swift Navigation | 8.1.2.1.8 | Update Stage 2 following the agreements that have been made in the LPP Running CR regarding the RealTimeIntegrity IE and DNU=FALSE condition. | For integrity purposes (as per Clause 8.1.1a), a GNSS satellite and signal combination should be considered as being marked “Do Not Use” (DNU) if the satellite ID and signal are present in the list of unhealthy (bad) signals.  NOTE: The absence of the Real Time Integrity assistance from any Provide Assistance Data message is interpreted as DNU=FALSE for all satellites and signals that are monitored for integrity.  [Rapp] Thanks, Updated. |
| CATT | 5.4.4 | Editorial error | In the last sentence, there should only be one space before TS 23.273.  as described in TS 23.273 [35].  [Rapp] Thanks, Updated. |
| CATT | 7.x | Editorial error | There should be a tabular key in the title of  7.x Procedures for On-Demand PRS transmission  [Rapp] Thanks, Updated. |
| CATT | 7.y | Editorial error | There should be a tabular key in the title of  7.y Procedures for Pre-configured Measurement Gap  [Rapp] Thanks, Updated. |
| CATT | 7.z | Editorial error | There should be a tabular key in the title of  7.z Procedures for Pre-configured PRS processing window  [Rapp] Thanks, Updated. |
| CATT | 8.1.1 | Editorial error | The reference file for NavIC should be [x2] not [xx].  - NAVigation with Indian Constellation (NavIC) [xx]. (regional coverage)  [Rapp] Thanks, Updated. |
| ZTE | 3.1 | Alignment issue with LPP running CR | ‘Pre-configured DL-PRS assistance data may consist of multiple instances, where each instance is applicable to a different area within the network’ this description should be aligned with LPP running CR, in which no multiple instances of AD(with validity area) is introduced  [Rapp] Did not change this for now since RAN2 has agreed  Agreements:  Proposal 1 (modified): Explicitly list the involved cell IDs in LPP along with the assistance data. The list can be provided per instance of assistance data. Can be discussed in running CR/ASN.1 whether there are signalling optimisations that improve this approach. |
| ZTE | 5.4.X | Editorial error | In addition, the PRU can transmit SRS to enable TRPs to measure and report UL positioning measurements (e.g., RTOA, UL-AoA, gNB Rx-Tx Time Difference, etc.) from PRU at a known location.  [Rapp] Updated. |
| ZTE | 7.X.2 | Step 2a needs modification | 2a. In case of UE-initiated On-Demand PRS, the UE sends an On-Demand PRS request to the LMF via LPP Request Assistance Data message. The On-Demand PRS request can be the request for a defined PRS configuration with PRS configuration ID or explicit parameter for PRS configuration and may be a request for PRS transmission or change to the PRS transmission characteristics for positioning measurements.  For the underlined part, it is confused that, it seems UE needs to request delta PRS configurations. We think requesting ID and explicit parameters are clear enough, so suggest to delete the underlined part.  [Rapp] Did not change. The unlined part is to describe what can be changed. |
| ZTE | 7.y.1 | Editorial error | pre-configurated should be pre-configured  [Rapp] Updated. |
| ZTE | 7.y.2 | Figure can be updated | In figure 7.y.2-1, gNB can be replaced by serving gNB and neighboring gNBs to differ step 1 and other steps. That will be more clear  [Rapp] It must be the serving gNB. I think the procedure is clear. Not change for now. |
| ZTE | 7.z.2 | Figure can be updated | Same comment as above  [Rapp] It must be the serving gNB. I think the procedure is clear. Not change for now. |
| Huawei, Hisilicon | 7.x.1 | The UE-initiated on-demand PRS request is send from UE to LMF, not from LMF.  *The UE-initiated mechanism is enabled by the UE request triggering a request from the LMF, and the actual PRS changes are requested by the LMF irrespective of whether the procedure is UE- or LMF-initiated.* | The UE-initiated mechanism is enabled by the UE ~~request~~ triggering a request ~~from~~ to the LMF, and the actual PRS changes are requested by the LMF irrespective of whether the procedure is UE- or LMF-initiated  [Rapp] Has been removed in v03. |
|  | 7.x.2 | 1/Step 6 in Figure 7.x.2-1 should only be “LPP Provide Assistance Data message” since posSI-based solution is agreed to be excluded.  2/ capture the following agreement on on-demand PRS response:  Agreement:  Proposal 9-1 (modified): To respond to an unfulfilled UE-initiated on-demand PRS request, an error cause may be provided to the UE. To be discussed under running CR if the cause values are new or if we reuse existing values. | Update Figure 7.x.2-1 for Step 6:  “Provide updated PRS configurations” to be changed as “LPP Provide Assistance Data (on-demand PRS response)”. The on-demand PRS response may include the updated configurations or error cause.  [Rapp] Updated. |
|  | 7.y.2 | The trigger condition for UL MAC CE should be specified as agreed in RAN2#117:  Agreements:  For triggering condition for the UL MAC CE, reuse current RRC condition for Rel-16 PRS gap request, taking into account preconfigured MG. If the preconfigured MG is there and can satisfy the UE’s requirement, the UE uses MAC CE, otherwise RRC message as in Rel-16. The selection is specified in RRC. Reuse the “not configured or not sufficient” language from Rel-16. | Add a description for the trigger condition for UL MAC CE:  If the UE requires measurement gaps for performing the requested location measurements, the UE sends UL MAC CE Activation/Deactivation Request to the gNB and indicates the requested measurement gap configuration based on the ID configured in step 1; The triggering condition for UL MAC CE is specified in TS 38.331 [14].  [Rapp] Updated. |
|  | 8.1.1a | Capture the following agreement on “DNU”:  Agreements:  Proposal 1. For the purpose of GNSS integrity feature added in Release17, use GNSS-RealTimeIntegrity IE to signal to UE bad satellites (and GNSS constellations).  Proposal 2. Update description of GNSS-RealTimeIntegrity IE and Stage 2 to clarly state what condition can be interpreted as DNU = FALSE. | Add the description to clearly state what condition can be interpreted as DNU = FALSE.  [Rapp] Has updated based on Swift’s comments. |

# Summary report and proposals