**3GPP TSG-RAN WG4 Meeting # 99-e R4-210XXXX**

**Electronic Meeting, 19th – 27th May 2021**

**Agenda item:** 9.20.1

**Source:** Moderator (Ericsson)

**Title:** Email discussion summary for [99-e][237] NR\_pos\_enh\_RRM

**Document for:** Information

# Introduction

The document contains discussion related to the RRM core requirements for gNB positioning measurements:

The document contains the following main topics:

* Topic #1: General aspects (Agenda item: 9.20.1)
* Topic #2: LS on gNB/UE Rx/Tx timing error mitigation (Agenda item: 9.20.1)
* Topic #3: Work plan for RRM core requirements (Agenda item: 9.20.1)

# Topic #1: General aspects

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2109103**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109103.zip) | CATT | **Observation 1: RAN4 need some feasibility study on the method of mitigating UE Rx/Tx and/or gNB Rx/Tx timing delays provided by RAN1, and provide some possible solutions on accuracy improving if the method is not feasible.**  **Observation 2: Some methods related to measurement and MG for reducing positioning measurement latency can be discussed and defined in RAN4 (e.g. CSSF improving, gap enhancement etc.). Details can be FFS.**  **Observation 3: UE behaviour (e.g. the receiving of PRS and transmission of SRS) to support positioning in RRC\_INACTIVE state is in RAN2 scope.**  **Proposal 1: RAN4 should focus on the DL NR positioning first for the support of positioning in RRC\_INACTIVE state.**  **Proposal 2: RAN4 need to specify the measurement requirements and accuracy requirements for positioning in RRC\_INACTIVE state after the behaviour is specified in RAN2.**  **Proposal 3: RAN4 need to specify the performance requirements and conformance test for the supported signals in A-GNSS positioning for NR and E-UTRAN.** |
| [**R4-2109224**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109224.zip) | Intel Corporation | **Observation 1: RAN4 is not supposed to enhance any current accuracy requirements related to mitigation of UE Rx/Tx and/or gNB Rx/Tx timing delays.**  **Proposal 1: RAN4 considers specifying an enhanced set of accuracy requirements with much higher SINR side condition targeting latency reduction in positioning in general.**  **Proposal 2: RAN4 to specify new measurement gap patterns dedicated to positioning with shorter MGRP.**  **Observation 2: Potential FR2 enhancements in measurement period requirements can be considered in RAN4.**  **Proposal 3: Specify INACTIVE mode measurement delay and accuracy requirements and potential reporting requirements in RAN4, subjecting to RAN1 design.**  **Proposal 4: Add the newly supported A-GNSS systems in TS 38.171: BDS B2a, BDS B3I and NavIC.** |
| [**R4-2109945**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109945.zip) | vivo | **Proposal 1: RAN4 should specify RRM requirements for UE DL measurements without measurement gap if corresponding procedures is enabled.**  **Proposal 2: RAN4 should specify RRM requirements for UE DL measurements with reduced UE measurement time if corresponding enhanced procedures are defined.**  **Proposal 3: RAN4 should specify RRM requirements for UE DL measurements with measurement gap with reduced UE measurement time if corresponding enhanced procedures are defined.**  **Proposal 4: RAN4 is to discuss feasibility of TEG.**  **Proposal 5: RAN4 is to specify RRM requirements for UE measurements in RRC-INACTIVE state.**  **Proposal 6: RAN4 is to specify RRM requirements for UL/gNB measurements in RRC-INACTIVE state if it is to be introduced in Rel-17.**  **Proposal 7: A-GNSS minimum performance requirements are specified for BeiDou B2a and BeiDou B3I navigation signals.**  **Proposal 8: A-GNSS minimum performance requirements are specified for NavIC.** |
| [**R4-2110016**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110016.zip) | Nokia, Nokia Shanghai Bell | **Proposal 1 : RAN4 needs to study characteristics of timing delays if TEG appears static or semi-static or dynamic in TX/RX scenarios with considering various front-end parameters and conditions including source of time delay.**  **Proposal 2 : RAN4 may first visit studies to find latency bottleneck during positioning measurements including measurement gap configuration. For the latency study, RAN4 needs to refer to latency analysis from RAN2.**  **Observation 1 : The on-demand PRS support can improves the positioning measurement latency, but RAN1/RAN2 discussions are not completed yet.**  **Observation 2 : It is early to discuss UE measurement behaviors in inactive mode, since RAN1/2 discussion are on going.**  **Proposal 3 : RAN4 starts with analysis on PRS resource configuration, positioning measurement period and DRX behaviors in the UE RRC\_INACTIVE state.**  **Proposal 4 : RAN4 starts discussions on performance requirements of the additional BDS and NavIC signals as extension of chapter 5,6 requirements in TS38.171 and TS36.171.** |
| [**R4-2110231**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110231.zip) | Ericsson | 1. Determine impact on positioning measurement accuracies after RAN1 progress on gNB/UE Rx/Tx timing delay aspects. 2. Possible reduction of measurement period through performing measurements without MG 3. Possible reduction of measurement period through definition of new MG pattern 4. Solution to UE positioning measurement period reduction is dependent on agreements in RAN1 and RAN2 5. Requirements should be defined to ensure reasonable compromise between UE power saving in RRC\_INACTIVE and measurement periods 6. Wait for further progress on the enhancements done by RAN2 and RAN3 7. Positioning measurements without gaps will impact RRM requirements due to gap sharing between RRM requirements and positioning measurements 8. Larger MGL to accommodate reduction of measurement period may also impact serving cell procedures |
| [**R4-2110917**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110917.zip) | Huawei, HiSilicon | **Proposal 1: RAN4 not to define new RRM requirements or update existing RRM requirements for timing error mitigation.**  **Proposal 2: RAN4 to consider the following enhancements for latency reduction**   * **Measurement period based on multiple sets of {N,T} capabilities** * **MG-less PRS measurement**   **Proposal 3: For DL positioning methods in RRC\_INACTIVE, RAN4 to define UE requirements for PRS measurement in RRC\_INACTIVE.**  **Proposal 4: For UL and DL+UL positioning methods in RRC\_INACTIVE, RAN4 to wait for the conclusions from RAN1/2 before discussing RRM impacts.**  **Proposal 5: RAN4 to add related conditions and requirements for BDS B2a, BDS B3I and NavIC in 36.171 and 38.171.** |

## Open issues summary

### Sub-topic 1-1 Mitigating UE Rx/Tx and/or gNB Rx/Tx timing delays

According to RP-210903

* *Specify methods, measurements, signalling, and procedures for improving positioning accuracy of the Rel-16 NR positioning methods by mitigating UE Rx/Tx and/or gNB Rx/Tx timing delays, including [RAN1, RAN2, RAN3, RAN4]*
  + *DL, UL and DL+UL positioning methods*
  + *UE-based and UE-assisted positioning solutions*

*Open issues and candidate options before e-meeting:*

**Issue 1-1-1: Definition of new or updated RRM requirements in relation to timing error mitigation**

* Proposals
  + Option 1: Do not define or update RRM requirements based on timing error mitigation (Intel, Huawei)
  + Option 2: Feasibility study on mitigation techniques needed to be able to improve positioning accuracy (CATT)
  + Option 3: RAN4 to study characteristics on timing delay (Nokia)
  + Option 4: Determine impact on RAN4 requirements after further timing error mitigation progress from RAN1 (Ericsson)
* Recommended WF
  + Discuss the options

### Sub-topic 1-2 Latency reductions

From RP-210903:

* *Specify the enhancements of signalling, and procedures for improving positioning latency of the Rel-16 NR positioning methods, for DL and DL+UL positioning methods, including:*
  + *Latency reduction related to the request and response of location measurements or location estimate and positioning assistance data; [RAN2, RAN3, RAN1]*
  + *Latency reduction related to the time needed to perform UE measurements; [RAN1, RAN4]*
  + *Latency reduction related to the measurement gap; [RAN1, RAN4, RAN2]*

*Open issues and candidate options before e-meeting:*

**Issue 1-2-1: General issues with latency reduction**

* Proposals
  + Option 1: RAN4 to find latency bottleneck for positioning measurements including MG configuration and RAN2 latency analysis (Nokia)
  + Option 2: None
* Recommended WF
  + Discuss the topic

**Issue 1-2-2: Latency enhancements in relation to UE measurement time**

* Proposals
  + Option 1: RAN4 to consider specifying enhanced set of accuracy requirements with much higher SINR side condition to reduce general positioning latency (Intel)
  + Option 2: Define {N,T} capabilities to indicate measurement/processing time (T) in relation to reference signal duration (T) (Huawei)
* Recommended WF
  + Discuss the topic and the options

**Issue** **1-2-3: Latency enhancements in relation to measurement gaps**

* Proposals
  + Option 1: Specify new measurement gap patterns with shorter repetition period (Intel)
  + Option 2: MG-less PRS measurement (Huawei)
  + Option 3: RRM requirement definition for reduction of measurement period by defining new MG configurations or MG-less measurement is dependent on agreements in RAN1/RAN2 (Ericsson, vivo)
* Recommended WF
  + Discuss the options

### Sub-topic 1-3 Inactive state positioning measurements

From RP-210903:

* *Specify methods, measurements, signalling and procedures to support positioning for UEs in RRC\_ INACTIVE state, for UE-based and UE-assisted positioning solutions, including [RAN2, RAN1, RAN3,RAN4]:*
  + *DL NR positioning methods and RAT-independent positioning methods* 
    - *Support of UE positioning measurements for UEs in RRC\_INACTIVE state*
    - *Reporting of positioning measurement or location estimate performed in RRC\_INACTIVE when the UE is in RRC\_INACTIVE state*

*Note: this work will be coordinated with the SDT WI.*

* + *As 2nd priority:*
    - *UL and DL+UL NR positioning methods*
    - *Support of gNB positioning measurements for UEs in RRC\_INACTIVE state*

*Open issues and candidate options before e-meeting:*

**Issue 1-3-1: Specify RRM requirements for positioning measurements in RRC\_INACTIVE state**

* Proposals
  + Option 1: Focus on DL measurements first and specify measurement and accuracy requirements after RAN2 specifies behaviour in RRC\_INACTIVE (CATT)
  + Option 2: Specify measurement delay and accuracy and potential reporting requirements in RAN4 based on outcome of other WGs (Intel, vivo)
  + Option 3: Define UE requirements for PRS measurement for DL positioning methods with RRC\_INACTIVE and wait for RAN1/RAN2 conclusions on UL/DL+UL positioning methods (Huawei)
  + Option 4: RAN4 to analyse PRS resource configuration, positioning measurement period and DRX behaviour in UR RRC\_INACTIVE state (Nokia)
* Recommended WF
  + Discuss the issue and its options

### Sub-topic 1-4 GNSS enhancements

* *Support the following enhancements of A-GNSS positioning [RAN2, RAN3, RAN4]*
  + *Specify support for BDS B2a signal*
  + *Specify support for BDS B3I signal*
  + *Specify support for NavIC to NR*

*Note: This objective is applicable to NR and E-UTRA.*

*Open issues and candidate options before e-meeting:*

**Issue 1-4-1: A-GNSS positioning enhancement**

* Proposals
  + Option 1: RAN4 to specify performance requirements and conformance test for supported signals in A-GNSS positioning for NR and E-UTRAN (CATT)
  + Option 2: Add BDS B2a, BDS B3I and NavIC in TS 38.171 (Intel, vivo, Huawei)
  + Option 3: Start discussion on performance requirements of additional BDS and NavIC signals to be added in TS 38.171 and TS 36.171 (Nokia)
  + Option 4: Wait on further progress on enhancements by RAN2 and RAN3 (Ericsson)
* Recommended WF
  + Discuss above options

### Sub-topic 1-5 New RRM positioning measurement and procedural requirements and their impact on existing RAN4 requirements

* *Discuss and specify new as well as the impact on the existing RAN4 requirements for positioning and other RRM measurements and corresponding procedures [RAN4]*

*Open issues and candidate options before e-meeting:*

**Issue 1-5-1: Gapless measurement**

* Proposals
  + Option 1: RAN4 to discuss impact of gapless measurements on RRM requirements due to gap sharing (Ericsson)
  + Option 2: None
* Recommended WF
  + TBA

**Issue 1-5-2: Larger MGL**

* Proposals
  + Option 1: RAN4 to discuss impact of larger measurement gap length usage on serving cell procedures (Ericsson)
  + Option 2: None
* Recommended WF
  + TBA

## Companies views’ collection for 1st round

### Open issues

Sub topic 1-1-1 Definition of new or updated RRM requirements in relation to timing error mitigation

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| **Company** | **Comments** |
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Sub topic 1-2-1 General issues with latency reduction

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| **Company** | **Comments** |
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Sub topic 1-2-2: Latency enhancements in relation to UE measurement time

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| **Company** | **Comments** |
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Sub topic 1-2-3: Latency enhancements in relation to measurement gaps

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| **Company** | **Comments** |
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Sub topic 1-3-1: Specify RRM requirements for positioning measurements in RRC\_INACTIVE state

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| **Company** | **Comments** |
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Sub topic 1-4-1: A-GNSS positioning enhancement

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| **Company** | **Comments** |
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Sub topic 1-5-1: Gapless measurement

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| **Company** | **Comments** |
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Sub topic 1-5-2: Larger MGL

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| **Company** | **Comments** |
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### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

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| **CR/TP number** | **Comments collection** |
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## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary** |
| **Sub-topic #1** | **Issue 1-1-1: Definition of new or updated RRM requirements in relation to timing error mitigation**  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #2** | **Issue 1-2-1: General issues with latency reduction**  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #2** | **Issue 1-2-2: Latency enhancements in relation to UE measurement time**  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #2** | **Issue 1-2-3: Latency enhancements in relation to measurement gaps**  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #3** | **Issue 1-3-1: Specify RRM requirements for positioning measurements in RRC\_INACTIVE state**  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #4** | **Issue 1-4-1: A-GNSS positioning enhancement**  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #5** | **Issue 1-5-1: Gapless measurement**  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic #5** | **Issue 1-5-2: Larger MGL**  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
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## Discussion on 2nd round (if applicable)

# Topic #2: LS on gNB/UE Rx/Tx timing error mitigation

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2109101**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109101.zip) | CATT | **Proposal 1: The issues related to the definitions of the timing errors and the Rx/Tx/RxTx TEGs:**   * **The remaining Rx/Tx time delays after the calibration cannot be evaluated by the UE/TRP. So it is unrealistic for UE/TRP to provide the remaining Rx/Tx time delays;**   + **FFS: Whether UE/TRP can provide the differences of the remaining Rx/Tx time delays** * **If the uncalibrated time delay is used, it can only be estimated by UE/TRP itself and has been compensated to the Rx/Tx reference point. The calibration error (remaining Rx/Tx time delay) is included in the reported measurement and may be also in the uncalibrated time delay.** * **UE/TRP may group the (remaining/uncalibrated) Rx/Tx time delays based on the RF chains and antenna panel used for receiving the DL PRS or transmitting the UL SRS. In this case, the timing errors in the same Rx/Tx/RxTx TEGs will be within the same margin. However, UE/TRP may not be able to ensure the timing errors in different Rx/Tx/RxTx TEGs are not within the same margin.** * **The issue applies to all the definitions of the UE/TRP Rx/Tx/RxTx TEG.**   **Proposal 2: Possible solution for enhancing the method of accuracy improving provided in LS: e.g. support a TRP providing the association information of DL PRS resources with Tx TEGs to the LMF if the TRP has multiple TEGs which are associated with different antenna panels or antenna arrays. And the solution can also be used for TRP Rx if needed but not applied for UE Rx/Tx.** |
| [**R4-2109945**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2109945.zip) | vivo | **Proposal 4: RAN4 is to discuss feasibility of TEG.**  **Proposal 9: RAN4 to discuss and conclude whether UE Rx timing error can be grouped based on following factors, e.g., Antenna panel, RF chain design, frequency, baseband sampling rate (or PRS BW and SCS) etc.**  **Proposal 10: RAN4 to discuss and conclude whether UE Tx timing error can be grouped based on following factors, e.g., Antenna panel, RF chain design, frequency, baseband sampling rate (or PRS BW and SCS), SRS antenna switching etc.** |
| [**R4-2110016**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110016.zip) | Nokia, Nokia Shanghai Bell | **Observation 3 :** RAN1 has agreed to support TEG studies firstly for DL-TDOA measurement case. It is expected that RAN1 continues to discuss the time delay impacts for other time-based methods.  **Observation 4 :** A goal of TEG study is to achieve cm-level positioning accuracy by mitigating this timing error. It may be related with RF margin in accuracy requirements.  **Observation 5** : If TEG dynamically changes, measuring the absolute Tx/Rx timing errors in DL-TDOA may be difficult as they are residual errors after calibration.  **Observation 6** : If TEG statically or semi-statically changes, then measuring the absolute Tx/Rx timing errors in DL-TDOA may be possible depending on TX / RX scenarios.  **Observation 7 :** RAN1 question in LS seems to have broad scopes, and TEG measurement feasibility is one of RAN4 study topics in Rel-17 NR positioning phase. As for now, it may be too early to clearly answer to RAN1 question.  **Proposal 5 :** Propose possible replies from RAN4 as   * RAN4 studies if TEG appears static or semi-static or dynamic in TX/RX scenarios with considering various front-end parameters and conditions in Rel-17 phase. * If TEG statically or semi-statically changes and measurable, feasibility study on the absolute Tx/Rx timing error estimation in DL-TDOA can be possible. |
| [**R4-2110233**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110233.zip) | Ericsson | 1. TRPs have distinct non-moving location and known beam direction i.e. sector orientation 2. The timing error differences between multiple T/RX chains within one TRP are known timing errors due to phase calibration and are accounted for by adjusted TRX timing 3. Residual timing error differences between multiple T/RX chains within one TRP after phase calibration are small and therefore it is not necessary to distinguish via TEG reporting 4. A TRP will only feature one TEG, therefore reporting of TEG is unnecessary. 5. Multiple gNB Rx and Tx TEG is not supported. Send reply LS to RAN1 on the issue. |
| [**R4-2110917**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110917.zip) | Huawei, HiSilicon | **Proposal 6: RAN4 does not need to send reply LS for R1-2104111.** |

## Open issues summary

According to R1-2104111:

*Agreement:*

* *Support the following for mitigating TRP Tx timing errors and/or UE Rx timing errors for DL TDOA*
  + *Support a UE to provide the association information of RSTD measurements with UE Rx TEG(s) to the LMF when the UE reports the RSTD measurements to the LMF if the UE has multiple TEGs*
  + *Support a TRP providing the association information of DL PRS resources with Tx TEGs to the LMF* *if the TRP has multiple TEGs*
  + *Support the LMF to provide the association information of DL PRS resources with Tx TEGs to a UE for UE-based positioning if the TRP has multiple TEGs*
  + *FFS: the details of the signalling, procedures, and UE capability*
* *Send an LS to RAN4 to check if there is any issue to support the above enhancements*

### Sub-topic 2-1 LS discussion

*Open issues and candidate options before e-meeting:*

**Issue 2-1-1: Send reply LS to RAN1**

* Proposals
  + Option 1: Not needed (Huawei)
  + Option 2: Yes (Ericsson, Nokia, CATT)
* Recommended WF
  + Discuss TEG feature feasibility to reach conclusion if reply LS is needed and what to include

### Sub-topic 2-2 Discussion on TEG and feasibility

*Open issues and candidate options before e-meeting:*

**Issue 2-2-1: Calibration error/residual timing error after calibration**

* Proposals
  + Option 1: The remaining Rx/Tx time delays after the calibration are unknown to the UE/TRP and therefore cannot be provided (CATT)
  + Option 2: TBA
* Recommended WF
  + Discuss topic

**Issue 2-2-2: TEG grouping**

* Proposals
  + Option 1: (CATT)
    - UE/TRP may group the timing error (with or without calibration) based on RF chains and antenna panel, such that timing errors in the same group are within certain margin
    - UE/TRP may not be able to ensure that timing errors are within the same margin
  + Option 2: Discuss and conclude whether UE Rx and UE Tx timing error can be grouped based on antenna panel, RF chain, frequency, baseband sampling rate, SRS antenna switching, etc. (vivo)
* Recommended WF
  + Discuss topic and options

**Issue 2-2-3: Time variant behaviour of TEG**

* Proposals
  + Option 1: (Nokia)
    - RAN4 to study if TEG appears static, semi-static or dynamic in TX/RX scenarios considering various front-end parameters and conditions
    - Feasibility study on absolute Tx/Rx timing error estimation in DL-TDOA if TEG changes measurably statically or semi-statically.
  + Option 2: TBA
* Recommended WF
  + Discuss

**Issue 2-2-4: Applicability of TEG with gNB/TRP**

* Proposals
  + Option 1: Support TRP to provide association information of DL PRS resources with Tx and Rx TEG to LMF if TRP has multiple TEG (i.e. different antenna panels or arrays) (CATT)
  + Option 2: TRP comprising multiple TEG is unlikely, therefore multiple Rx and Tx TEG is not supported (Ericsson)
* Recommended WF
  + Discuss topic and its options

**Issue 2-2-5: Applicability of TEG with UE**

* Proposals
  + Option 1: Not applicable (CATT)
* Recommended WF
  + Discuss

## Companies views’ collection for 1st round

### Open issues

Sub topic 2-1-1: Send reply LS to RAN1

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| **Company** | **Comments** |
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Sub topic 2-2-1: Calibration error/residual timing error after calibration

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| **Company** | **Comments** |
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Sub topic 2-2-2: TEG grouping

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| **Company** | **Comments** |
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Sub topic 2-2-3: Time variant behaviour of TEG

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| **Company** | **Comments** |
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Sub topic 2-2-4: Applicability of TEG with gNB/TRP

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| **Company** | **Comments** |
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Sub topic 2-2-5: Applicability of TEG with UE

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| **Company** | **Comments** |
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### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

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| **CR/TP number** | **Comments collection** |
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## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

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|  | **Status summary** |
| **Sub-topic#1** | Sub topic 2-1-1: Send reply LS to RAN1  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic#1** | Sub topic 2-2-1: Calibration error/residual timing error after calibration  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic#1** | Sub topic 2-2-2: TEG grouping  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic#1** | Sub topic 2-2-3: Time variant behaviour of TEG  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic#1** | Sub topic 2-2-4: Applicability of TEG with gNB/TRP  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |
| **Sub-topic#1** | Sub topic 2-2-5: Applicability of TEG with UE  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

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| **CR/TP number** | **CRs/TPs Status update recommendation** |
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## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Topic #3: Work plan for RRM core requirements

## Companies’ contributions summary

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| **T-doc number** | **Company** | **Proposals / Observations** |
| [**R4-2110232**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110232.zip) | Ericsson | **Work plan for RRM core requirements** |
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## Open issues summary

### Sub-topic 2-1 RRM core requirements work plan

*Open issues and candidate options before e-meeting:*

**Issue 3-1-1: Work plan can be approved?**

* Proposals
  + Option 1: Yes
  + Option 2: No
* Recommended WF
  + Discuss issues with work plan if any and agree on final work plan.

## Companies views’ collection for 1st round

### Open issues

Sub topic Issue 3-1-1: Work plan approval

|  |  |
| --- | --- |
| **Company** | **Comments** |
|  |  |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
|  |  |
|  |
|  |
|  |  |
|  |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | Sub topic Issue 3-1-1: Work plan approval  *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
|  |  |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| [**R4-2110232**](https://www.3gpp.org/ftp/TSG_RAN/WG4_Radio/TSGR4_99-e/Docs/R4-2110232.zip) | Work plan for RRM core requirements | Ericsson |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents