3GPP TSG-RAN WG3 Meeting #127bis R3-252306
Wuhan, China, 7 – 11 April, 2025

Agenda Item: 20.2

Source: CATT (moderator)

Title: Summary of Offline Discussion on AIPHY

Document for: Approval

# Introduction

The following CB is discussed in this document:

**CB: # AIPHY**

* **For Case3a, start with the solution signaling flow in 1720 based on common understanding on whether LMF or gNB selects the UE**
* **Check the TP for Case3b in R3-251770**
* **Capture agreements and open issues**

(moderator - CATT)

Summary of offline disc R3-252306

# For the Chairman’s Notes

Propose the following:

**Case 3a data collection:**

* Focus on Opportunistic solution at this meeting, the call flow is updated a little bit on top of the Option 1, the draft TP could be found in section 6. (a separate TP will be provided to the inbox for further check)
* Further consider whether and how to support Proactive solution the next meeting.

**Case 3b:**

**On support of sample based measurement**

* Focus on NRPPa TP at this meeting, work on F1AP TP later when NRPPa TP is stable.
* NRPPa TP in R3-25xxxx, with FFS to the new introduced Measurement Type.
* LS out to RAN1 in R3-25xxxx

# Discussion

## Case 3a

For Case 3a, we mainly discussed how the data collection is performed during online discussion, especially for the issue “**Which entity to perform the UE selection? LMF or gNB?”.**

The call flow in 1720 is taken as start point to further discuss the signalling flow of data collection.

* **For Case3a, start with the solution signaling flow in 1720 based on common understanding on whether LMF or gNB selects the UE.**

The call flow in 1720 is copied here for reference:



**Figure 7.x.2-1 Data Collection Information Transfer Procedures**

1. LMF initiates the Data Collection Notification procedure towards the gNBs which holds the AI/ML positioning model to establish the NRPPa transaction.

Note: This step could be ignored if NRPPa transaction(s) has already been established between the gNB and LMF for other purposes.

2. When gNB decides to train the model for AI/ML based positioning, it may request for the training data from LMF.

3. The gNB sends the Data Collection Request towards the LMF, with some assistance information, e.g. expected amount of UE labels, expected data type.

4. LMF confirms the requirements of the gNB and replies with the response message.

5. LMF decides the UE labels and initiates proper positioning procedures to collect the training data via the Positioning Information Transfer and Measurement procedures.

6. When the training data is collected, LMF provides the training data to the gNB via the Data Collection Update.

**Potential Way Forward:**

Go for a unified solution to cover both “Proactive” and “Opportunistic”.



**Figure x Data Collection Information Transfer Procedures (option 1)**



**Figure x Data Collection Information Transfer Procedures (Option 2)**

**Option 3:**



**Data Collection Request via NGAP (Option 3)**

1. LMF initiates the Data Collection Notification procedure towards the gNBs which holds the AI/ML positioning model to establish the NRPPa transaction.

2. When gNB decides to train the model for AI/ML based positioning, it may request for the training data from LMF.

3. The gNB sends the Data Collection Required towards the LMF.

**Editor’s Note:**

Step 3 is non-UE specific procedure for gNB to request for the data collection towards LMF. The signalling details could be further discussed, e.g. what information should be provided in the Request (TRP ID, number of UEs, etc.)

Due to the design of the signallings, two options:

* **Option 1:** Make step 1/3 as two class 2 procedures.
* **Option 2:** Make Step 1/3 as 1 class 1 procedures (e.g. Data Collection Notification and confirmation, naming could be further checked)
* **Option 3:** Data Collection Request via NGAP

**Proposal 1: Discuss and decide to which option to go to initiate NRPPa transaction for data collection in case 3a.**

🡺Base on the email discussion, it seems better to select option 1, use class 2 message to initiate the NRPPa transaction, and use class 2 to request for training data towards LMF.

4. LMF indicates gNB the UE is selected for data collection and gNB indicates LMF the Part B is needed for the UE when performing Measurement procedures for a UE.

**Editor’s Note:**

After step 3, it’s not necessary for LMF to trigger the UE label selection and corresponding positioning procedures immediately. When positioning sessions are triggered for a UE for any purpose, LMF may select it as the UE label. (We do not specify how UE label is selected by LMF, just focus on the NRPPa procedures after LMF select the UE for data collection)

LMF indicates the gNB the UE is selected for data collection (e.g. add an indicator in Measurement Request), the gNB could obtain the Part A internally.

**Proposal 2: Discuss and decide whether to introduce an indicator in the MEASUREMENT REQUEST to indicate the UE is selected for requested data collection.**

As proposed in some contributions (e.g. 2084), an indicator in Measurement Response may also be needed to confirm the selected UE for data collection, and request for the Part B.**Proposal 3: Discuss and decide whether to introduce an indicator in the MEASUREMENT RESPONSE to confirm the data selection, and indicate the Part B is needed.**

🡺 Base on the email discussion, the measurement procedure is non-UE associated, it seems not proper to use it to transfer UE specific information. Keep the measurement procedure unchanged is preferred.

5. LMF provides the requested training data to the gNB via the Data Collection Update. gNB associate Part A and Part B and use them as the collected data for AI/ML model training.

**Editor’s Note:**

FFS on how to associate Part A and Part B.

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**Proposal 4: Introduce a new class 2 procedure (DATA COLLECTION UPDATE) to provide Part B of a UE label. How to associate Part A and Part B is FFS.**

**Proposal 6: Discuss and agree the call flows and texts for stage 2 BL CR, latest call flow is provided in section 6.**

## Case 3b

Check stage 3 TPs for 38.455 and 38.473 in R3-251770 to make support of Sample-Based Measurement as agreed by RAN1.

* Focus on NRPPa TP at this meeting, work on F1AP TP later when NRPPa TP is stable.
* Measurement type should be added, with FFS.

**Proposal 7: Discuss and agree the TPs to make support of Sample-Based Measurement.**

Discuss the potential LS out on behalf of [R3-252026](file:///F%3A%5C%E4%BC%9A%E8%AE%AE%E6%96%87%E4%BB%B6%5CRAN3%5C2025%E5%B9%B4%5CRAN3%23127bis%E6%AD%A6%E6%B1%89%5CDocs%5CR3-252026.zip), if the TP(s) are agreed.

**Proposal 8: Reply the LS to RAN1 to indicate RAN3 progress on LMF-based AI Positioning.**

# Conclusion, Recommendations [if needed]

**To be updated later, if needed.**

# References

1. R3-251509 Reply LS on LMF-based AI/ML Positioning for Case 3b (RAN1(Ericsson)) LS in
2. R3-251510 LS on AI/ML Positioning Case 3b (RAN1(Ericsson)) LS in
3. R3-252026 [DRAFT] LS reply on AI/ML Positioning Case 3b (Ericsson) LS out To: RAN1, RAN2 CC:
4. R3-251720 (TP to BL CRs) Support of gNB-based AI positioning (CATT) other
5. R3-251769 (TP for TS 38.455) Support of gNB-side model (case 3a) (Xiaomi) other
6. R3-252027 Discussion on data collection procedures to support gNB-sided model (case 3a) (Ericsson) discussion
7. R3-251617 [TP to 38.455 & 38.401] Support of AI/ML assisted Positioning (case 3a) (ZTE Corporation) other
8. R3-251618 (TP to BLCR to TS 38.455 & TS38.473) Discussion on AI/ML assisted positioning (case 3b) (ZTE Corporation) other
9. R3-251692 Discussion on AIML based Positioning Accuracy Enhancements (NEC) discussion
10. R3-251719 (TP to BL CR for TS38.455) Support of LMF-based AI positioning (CATT) other
11. R3-251770 (TP for 38.455 and TS 38.473) Support of Sample-based measurement for LMF-side model (case 3b) (Xiaomi, Ericsson) other
12. R3-251800 Discussion on Case 3a in AI/ML for positioning (Samsung, JIO Platforms) discussion
13. R3-251801 Discussion on Case 3b in AI/ML for positioning (Samsung, JIO Platforms) discussion
14. R3-251867 Discussion on support of direct AI/ML positioning (Case 3b) (China Telecom) discussion
15. R3-251868 Discussion on support of AI/ML assisted positioning (Case 3a) (China Telecom) discussion
16. R3-251953 AIML for gNB assisted positioning (Lenovo) discussion
17. R3-251957 AI/ML based positioning accuracy enhancements (Qualcomm Incorporated) discussion
18. R3-252001 (TP for AI/ML BLCR to TS 38.455) Discussion on RAN3 impacts for Direct AI/ML positioning (Case 3b) (Huawei) other
19. R3-252002 (TP for AI/ML BLCR to TS 38.455) Discussion on RAN3 impacts for NG-RAN node-assisted AI/ML positioning (Case 3a) (Huawei) other
20. R3-252028 (TPs to NRPPa and NGAP BL CRs to support case 3a) (Ericsson) other
21. R3-252034 (TPs To BL CRs) Support Direct AI ML Positioning (CMCC) other
22. R3-252035 Support Assisted AI ML Positioning (CMCC) discussion
23. R3-252084 (TP to TS 38.305) Model training at gNB for Case 3a (Nokia) other
24. R3-252085 (TP to TS 38.300) Intermediate feature reporting and general principles for case 3a (Nokia) other
25. R3-252154 AI/ML-Enhanced Positioning Enhancements for NRPPa (Jio Platforms Ltd (JPL)) discussion
26. R3-252163 Model training/monitoring at gNB for Case 3a (CEWiT) discussion

# TP to BL CR for TS 38.305 data collection procedures for Case 3a

7.x Procedures for Data Collection Information Transfer

7.x.1 General

To support AI/ML based positioning with gNB-side model, data collection information is used to enable the data training in gNB-side AI model.

7.x.2 Data Collection Information Transfer Procedures

Figure 7.x.2-1 shows the Data Collection Information Transfer Procedure.



**Figure x Data Collection Information Transfer Procedures**

1. LMF initiates the Data Collection Notification procedure towards the gNB to establish the NRPPa transaction for data collection.

2. gNB determines to take the on-going UL positioning measurement into account for data collection.

3. gNB sends Data Collection Required to the LMF to request for the Part B of the selected UE.

Editor’s Note: FFS on the details of the signalling, e.g. including NRPPa Measurement ID for Part A, Part B association.

4. LMF sends Data Collection Update to the gNB with the requested data (Part B) to the gNB.

Editor’s Note: FFS on Data Collection Update is UE specific or non-UE specific.

Editor’s Note: FFS on how the Part A and Part B are associated in the gNB (e.g. using Measurement ID, or time stamp or other info).

Editor’s Note: FFS on whether and how to support proactive data collection.