**3GPP T****SG-RAN WG3 Meeting #129-bis R3-257239**

**Prague, Czech Republic, 13 – 17 October 2025**

**Agenda Item: 12.2.2**

**Source: Qualcomm (moderator)**

**Title: Summary of Offline Discussion for CB: # 22\_AIMLintraCULTM**

**Document for: Discussion**

1 Introduction

**CB: # 22\_AIMLintraCULTM**

**- TP to capture the agreement in appropriate way**

**- discuss the above open issues**

(QC - Moderator)

Summary of the offline discussion in [R3-257239](file:///D:\3GPP%20Standardization\RAN3\RAN3%23129bis\agenda\Inbox\R3-257239.zip)

2 For the Chair Notes

**For AI/ML study we consider both L1 and L3 measurement based Intra-CU LTM.**

**Study candidate beams along with candidate cells for AI/ML based Intra-CU LTM HO preparation.**

**Further discuss whether to study addition of beam prediction in UE Trajectory prediction.**

**Further discuss predicting TA value in the next meeting.**

**WA: Study prediction of validity time of a measured TA value**

3 Discussion

3.1 L1 and L3 Measurements based LTM

In the online discussion there was a confusion on what it means by considering both L1 and L3 Measurements based Intra-CU LTM for AI/ML based optimization.

Considering L1 and L3 Measurements based Intra-CU LTM for AI/ML based optimization means -

* Considering L1 and L3 measurements as input for AI/ML use cases
* Considering L1 and L3 measurements as feedback

**Are companies ok with the above explanation and agree to consider both L1 and L3 measurements for AI/ML based Intra-CU LTM?**

**For AI/ML study we consider both L1 and L3 measurement based Intra-CU LTM.**

HW, E///: Flavors of IntraCU LTM should be dependent on AI/ML framework

NEC, SS, QC, China Telecom, CATT: support the above statement

CMCC, Nok, HW: Prefer L3 first

ZTE, LGE: would like to discuss use cases first

3.2 Beam Prediction

Some companies in their paper have mentioned interest to study beam prediction for LTM -

**R3-256537** - Proposal 5: Introduce a finer granularity based on beam-level for UE trajectory prediction

**R3-256549** - Proposal 2 Finer granularity UE trajectory prediction and predicted L3 measurement results can be used as a kind of assistance information for candidate cell selection. Proposal 3 The gNB-CU can internally use the predicted information (e.g., cell/beam-level UE trajectory prediction or predicted L3 measurements) to assist with candidate cell selection.

**R3-256862** – Proposal 1: Based on R18 AI/ML-based Mobility Optimization, following objective for LTM may be achieved by AI/ML model:

- Efficient early TA acquisition;

- Beam level UE Location prediction;

- Optimization on candidate cells selection;

- Optimization on execution conditions;

**R3-256610** – Proposal 5: Along with Candidate cell and Target cell prediction, beam prediction should also be considered for the LTM Handover Preparation and LTM handover execution to reduce LTM HO failures due to incorrect beam. Proposal 6: UE Trajectory Prediction carried in the LTM Handover Request should include beam prediction to assist subsequent LTM handovers.

It was also captured in online meeting to discuss beam prediction as - **beam prediction should also be considered?**

**Are companies ok to study beam prediction along with Cell prediction for LTM handover preparation and execution?**

**Study candidate beams along with candidate cells for AI/ML based IntraCU LTM HO preparation**

**Are companies ok to study addition of beam prediction in UE Trajectory prediction?**

**ZTE, NEC, CATT, QC: Agree to study this**

**Nok, HW, E///, SS, LGE: It’s the second step to discuss this**

**Further discuss whether to study addition of beam prediction in UE Trajectory prediction**

3.3 TA Prediction

Many companies have shown interest in studying TA prediction for Intra-CU LTM.

1. **R3-256537** - Proposal 3: RAN3 to investigate AI/ML mechanisms to aid triggering of early synchronization (DL and UL) for both L3 based LTM and L1 based LTM.
2. **R3-256549** - Proposal 5 TA value calculation can be performed more accurate with AI/ML techniques. RAN3 is kindly to discuss the solutions above implement TA value prediction.
3. **R3-256695** - Proposal 3: The predicted TA value of candidate cell(s) and the corresponding validity time can be taken as the output of the AI/ML model training/inference.
4. **R3-256862** - Proposal 3: In intra-DU LTE, it is also suggested to use the historical TA value measured by UE for all the candidate cells as input to predicate the TA value in AI/ML model.
5. **R3-256913** - Proposal 2: RAN3 to discuss AI/ML for Early TA prediction, e.g., gNB-CU predicts the TA value for the candidate cell.
6. **R3-257077** - Proposal 1: To mitigate the F1 signalling burden issue caused by early synchronization, RAN3 should consider predicting the TA value for candidate gNB-DUs or cells using AI/ML functionality within the NG-RAN node.

**Are companies ok to study prediction of TA value for AI/ML based IntraCU LTM?**

**Further discuss predicting TA value in the next meeting.**

CATT, Nok, E///, HW, Google: incorrect prediction of TA value lead to LTM HO failures and don’t support TA value prediction

CMCC: Disagree with CATT, AI principle is to make the right prediction and cannot lead to prediction failures

QC, SS, ZTE, LGE, NEC, China Telecom, CMCC, Lenovo, Orange: agree to study TA value prediction scenarios

**Are companies ok to study prediction of TA value validity time for AI/ML based IntraCU LTM?**

**WA: Study prediction of validity time of a measured TA value**

3.4 Inference in DU

Many companies have proposed Inference in the DU for AI/ML based IntraCU LTM. This can be based on the AI/ML use cases studied for IntraCU LTM.

**Do companies agree to study Inference in DU based on AI/ML use cases for IntraCU LTM?**

**Not Discussed**