3GPP TSG-RAN WG3 Meeting #125 R3-244700

Maastricht, NL, from Aug 19 to Aug 23 2024

Agenda Item: 11.4

Source: ZTE (Moderator)

Title: SoD on CB: # AIRAN4\_Others

Document for: Approval

# 1 Introduction

This SoD is to discuss the following CB:

**CB: # AIRAN4\_Others**

**- Finalize TPs for NR-DC, split architecture and continuous MDT**

**- Draw the conclusion**

(moderator - ZTE)

Summary of offline disc [R3-244700](file:///D:\3GPP\TSGR3_124\Inbox\Drafts\CB%20%23%20AIML3_Leftovers\Inbox\R3-244700.zip)

# 2 Discussion

For chairman notes:

There is no consensus to transfer the predicted/measured UE trajectory over NR-DC. FFS to support it during normative phase.

During offline discussion, majority of companies (7) support the predicted/measured UE trajectory, while 2 companies disagree.

**The details of signaling measured UE performance metrics from DU to CU-CP and/or from CU-UP To CU-CP needs further discussion during normative phase.**

**Remove the agreement: Transferring Measured UE performance from CU-UP to CU-CP.**

**Keep the current use case description and add, "Potential solutions and standard impacts are left for further discussion during the normative phase."**

# 2 Discussion

## 2.1 Mobility Optimization for NR-DC

In the previous meeting, the agreements for NR-DC are listed as follows:

*NR-DC mobility optimization:*

*Agree to take as baseline for the Mobility Optimization for NR-DC that the use case is studied assuming inference at the MN. The main use case is limited to dual connectivity only (e.g. no conditional procedures are in scope).*

*Enhance the Dual Connectivity procedure (e.g., MN-initiated SN addition, MN-initiated SN change) to trigger the collection of measured UE performance.*

Discuss following proposals:

1. **Enhance the Dual Connectivity procedure (e.g., MN-initiated SN addition, MN-initiated SN change, MN-initiated SN Modification) to transfer the predicted UE trajectory information (e.g., predicted PSCell(s)).**

Nokia: How could MN predict this information.

CATT: Source node can predict the information based on measured UE history information. In Rel-19, MN has all the information to predict.

E///: SN can decide addition? MN control SN decision.

HW: In the current, predicted UE trajectory is sent to the target node via HO procedure. Why we can not do the this in NR-DC case?

Lenovo: Share same view as CATT and HW. SN can decide the PSCell based on the trajectory information.

1. **Enhance the Dual Connectivity procedures (e.g., MN-initiated SN addition, MN-initiated SN change, MN-initiated SN Modification) to trigger the collection of measured UE trajectory information (e.g., measured PSCell) and measured UE performance.**



There is no consensus to transfer the predicted/measured UE trajectory over NR-DC. FFS to support it during normative phase.

1. **Source MN provides the UE trajectory prediction information to the source SN to assist source SN to set SN initiated SN change decision.**
2. **For AI/ML based Mobility Optimization in NR-DC, add support for requesting and reporting of non-UE associated metrics, e.g., the F1 propagation delay for a SN/PSCell.**

**Proposal 5 For inter-Master Node handover with/without SN change, enhance existing Handover Request message to transfer following predicted information:**

**- Predicted PSCell List**

**- Predicted PCell List**

## 2.2 Split architecture

For the split architecture, the following agreement so far is listed below:

*Measured Energy Cost can be transferred from DU to CU.*

*Transferring Measured UE performance from CU-UP to CU-CP.*

Following proposal discussed online:

*Measured information over split architecture:*

Over F1 interface:

**Proposal 1a: Transferring Measured UE performance from DU to CU. Details of Measured UE performance and granularity of UE performance is left to normative phase.**

**Proposal 2a: CU-UP has all the information of UE performance. There is no need to transfer any UE performance over F1 interface.**

**The details of signaling measured UE performance metrics from DU to CU-CP and/or from CU-UP To CU-CP needs further discussion during normative phase.**

*Remove the agreement :Transferring Measured UE performance from CU-UP to CU-CP.*

**Whether to measured UE performance from DU to CU needs further discussion during normative phase.**

Capture into TR: Potential solution to support CU(-CP) to achieve the UE performance information from DU can be further discussed during normative phase.

Over E1 interface:

1. **Transferring Measured EC from CU-UP to CU-CP.**

*Predicted information over split architecture:*

**Predicted information from CU to DU:**

* **Predicted Radio Resource Status, Predicted Number of Active UEs, Predicted RRC connections**
* **Predicted UE trajectory**

1. **RAN3 to discuss whether the UE trajectory prediction received from the source gNB over Xn can be transferred from the target CU to target DU(s) over the F1 for timely resource allocation in target gNB cells which are expected to be visited by the UE.**
2. **RAN3 to discuss whether other prediction information (Predicted Radio Resource Status, Predicted Number of Active UEs, Predicted RRC connections) needs to be transferred from CU/CU-CP to DU/CU-UP for the intra-gNB cases.**

## 2.3 Continuous MDT collection

Following is the current content captured into the TR about the use case description:

### *5.4.1 Use Case Description*

*The problem of continuous data collection for management-based MDT can be described as follows: a UE in the NG-RAN can be configured with management-based Logged MDT when in RRC\_Idle and RRC\_Inactive states and with management-based Immediate MDT when in RRC\_Connected state. Differently from signalling-based MDT, in management-based MDT, a UE is not uniquely identified in the MDT activation. Therefore, when a UE transits to RRC\_Connected state from RRC\_Idle/RRC\_Inactive (during which Logged MDT data have been collected) or when a UE is handed over between gNBs, the network does not have standardized means to select again the same UE for continuous MDT for subsequent MDT data collection.*

*The Data Collection continuity in this scenario can be split into two tasks as below:*

***- Problem A (measurement continuity)****: how to ensure that the same UE collecting MDT measurements during the same RRC state and across different RRC states.*

***- Problem B (trace correlation)****: how to ensure that the TCE which eventually receives the MDT reports can associate the received logged and immediate MDT measurements to a continuous data collection period from the same UE.*

**Two options for the continuous MDT collection:**

* **Option 1: Keep the current use case description and add, "Potential solutions and standard impacts are left for further discussion during the normative phase."**
* **Option 2: Capture all the solutions proposed by companies into the TR and then perform a down-selection.**

Corresponding to problem A (measurement continuity), the following categories of solutions can be considered:

* **Solution A1**: Upon transition from RRC\_Idle or RRC\_Inactive to RRC\_Connected, the UE indicates to the gNB that it should be selected for continuous management-based immediate MDT. In case of handover, the source gNB sends this information to the target gNB during handover preparation.
* **Solution A2**: When UE transits to RRC\_Idle, a context related to the MDT configuration is stored by the gNB serving the UE to the Core Network. Upon transition from RRC\_Idle to RRC\_Connected or after successful handover, the AMF indicates to the second gNB serving the UE that the UE should be selected for management-based immediate MDT. In case of handover, the source gNB sends the context related to the data collection to the target gNB during handover preparation.
* **Solution A3**: UE logs measurements across RRC states (RRC\_Idle, RRC\_Inactive, RRC\_Connected), and hence also independently of any handover in RRC\_connected, by enhancing management-based Logged MDT.

For problem B (trace correlation), several solutions have been discussed:

* **Solution B1**: Send TR and TRSR of the Logged MDT configuration to the TCE together with the Immediate MDT data records.
* **Solution B2**: Create an identifier at the AMF, e.g. generated when the UE registers to the network and UE context is created in the CN and maintained in the CN for the duration of the UE context. Alternatively, if confirmed as a valid option by SA5, use the S-TMSI for this purpose. Provide this identifier to the TCE together with TR/TRSR for the immediate MDT session and for the logged MDT session. This mechanism may rely on the legacy Cell Traffic Trace mechanism.
* **Solution B3**: Introduce a new Job Type for “Logged and Immediate MDT”
  + Solution B3a: The same TR is used for both Logged and Immediate MDT Configuration
  + Solution B3b: Different TRs may be used for Logged and Immediate MDT Configuration with Continuous Indication in the Logged MDT Configuration