**3GPP TSG-RAN WG3 Meeting #122R3-238018**

**Chicago, USA, 13 - 17 November 2023**

Agenda Item: 14.2

Source: Huawei, Nokia, Nokia Shanghai Bell, NEC, Google, ZTE, Samsung, CATT, Ericsson

Title: (TP for L1L2Mob BLCR for TS 38.401): LTM procedure update

Document for: Other

# Introduction

This document contains the TP to LTM BLCR to 38.401.

# TS 38.401 TP

8.2.1.X Intra-gNB-DU LTM

This procedure is used for the case when the UE moves within the same gNB-DU during NR operation for LTM. Figure 8.2.1.x-1 shows the intra-gNB-DU LTM procedure for intra-NR.



**Figure 8.2.1.x-1: Intra-gNB-DU LTM**

1. The UE sends a *MeasurementReport* message (L3 measurement result) to the gNB-DU containing measurements of neighbouring cells. The gNB-DU sends an UL RRC MESSAGE TRANSFER message conveying the received *MeasurementReport* message to the gNB-CU.
2. The gNB-CU determines to initiate LTM configuration.
3. The gNB-CU sends a UE CONTEXT MODIFICATION REQUEST message to the gNB-DU containing one target candidate cell ID, the LTM configuration ID of the candidate cell, and LTM configuration ID mapping list, the CSI Resource Configuration. The gNB-CU requests PRACH resources from the gNB-DU. The gNB-CU may request the gNB-DU to provide the lower layer configuration for the purpose of generating the reference configuration.
4. If the gNB-DU accepts the request of LTM configuration, it responds with a UE CONTEXT MODIFICATION RESPONSE message including the generated lower layer RRC configurations (e.g., TCI state configuration, RACH configuration, and the CSI Report Configuration for the accepted target candidate cell.

NOTE: Steps 3 and 4 may be initiated multiple times for LTM candidate cell preparation of multiple cells including the source cell.

1. The gNB-CU sends a UE CONTEXT MODIFICATION REQUEST message to the source gNB-DU including the collected TCI state configurations and CU may send the CSI resource Configuration for the accepted target candidate cells.
2. The source gNB-DU responds with a UE CONTEXT MODIFICATION RESPONSE message which includes the generated CSI report configuration of the source cell.

NOTE: In case of subsequent LTM, UE CONTEXT MODIFICATION procedure may be invoked per candidate cell to transfer to the candidate gNB-DU the CSI resource Configuration, TCI state information, RACH Configuration, and the LTM configuration IDs of the candidate cells.

1. The gNB-CU sends a DL RRC MESSAGE TRANSFER message to the gNB-DU, which includes the generated *RRCReconfiguration* message with the LTM configuration.
2. The gNB-DU forwards the received *RRCReconfiguration* message to the UE.
3. The UE responds to the gNB-DU with an *RRCReconfigurationComplete* message.
4. The gNB-DU forwards the *RRCReconfigurationComplete* message to the gNB-CU via an UL RRC MESSAGE TRANSFER message.
5. Early synchronization is performed as specified in TS 38.300 [2].
6. The UE sends the L1 measurement result to the gNB-DU. The gNB-DU decides to execute LTM.
7. The gNB-DU sends the Cell Switch command to the UE.
8. The gNB-DU sends the UL CELL CHANGE NOTIFICATION message to the gNB-CU to indicate the initiation of the LTM command to the UE including the target cell ID and the TCI state ID.
9. The target gNB-DU detects the UE access as specified in TS 38.300 [2].
10. The target gNB-DU sends the ACCESS SUCCESS message to the gNB-CU with the target Cell ID.
11. The UE sends an *RRCReconfigurationComplete* message to the gNB-DU.
12. The gNB-DU forwards the *RRCReconfigurationComplete* message to the gNB-CU via an UL RRC MESSAGE TRANSFER message.
13. The gNB-CU may send the UE CONTEXT MODIFICATION REQUEST message to the gNB-DU to release the resources of prepared cells.
14. The gNB-DU responds with a UE CONTEXT MODIFICATION RESPONSE message.

**---------------------------------------------------------Next change -------------------------------------------------------------**

8.2.1.Y Inter-gNB-DU LTM

This procedure is used for the case when the UE moves from one gNB-DU to another gNB-DU within the same gNB-CU during NR operation for LTM. Figure 8.2.1.Y-1 shows the inter-gNB-DU LTM procedure for intra-NR.

**Figure 8.2.1.Y-1: Inter gNB-DU LTM**

1. The UE sends a *MeasurementReport* message (L3 measurement result) to the source gNB-DU containing measurements of neighboring cells. The source gNB-DU sends an UL RRC MESSAGE TRANSFER message conveying the received *MeasurementReport* message to the gNB-CU.

2. The gNB-CU determines to initiate LTM configuration.

3. The gNB-CU sends a UE CONTEXT SETUP REQUEST message to the candidate gNB-DU, containing one target candidate cell ID, the LTM configuration ID of the candidate cell, LTM configuration ID mapping list, and the CSI Resource Configuration. The gNB-CU indicates the source gNB-DU ID, and requests PRACH resources from the Candidate gNB-DU. The gNB-CU may request the candidate gNB-DU to provide the lower layer configuration for the purpose of generating the reference configuration.

4. If the candidate gNB-DU accepts the request of LTM configuration, it responds with a UE CONTEXT SETUP RESPONSE message including the generated lower layer RRC configurations (e.g., TCI state configuration and RACH configuration) and the CSI report configuration for the accepted target candidate cell.

NOTE: UE Context Modification procedure may be initiated for preparing candidate cells in the source gNB-DU as specified in step 3 and 4 in 8.2.1.X Intra-gNB-DU LTM.

5. The gNB-CU sends a UE CONTEXT MODIFICATION REQUEST message to the source gNB-DU including the CSI resource configuration, TCI state configuration, RACH configuration, and the TCI state configuration for the accepted target candidate cell(s) in other gNB-DUs.

6. The source gNB-DU responds with a UE CONTEXT MODIFICATION RESPONSE message which includes the generated CSI report configuration.

7. The gNB-CU sends a UE CONTEXT MODIFICATION REQUEST message to the candidate gNB-DU(s) containing TCI state information, RACH Configuration, and the LTM configuration IDs of the candidate cells in other candidate gNB-DU(s),. The gNB-CU may also provide the lower layer part of the reference configuration to the candidate gNB-DU(s). The gNB-CU may also provide an updated CSI Resource Configuration to the candidate gNB-DU(s).

NOTE: The candidate cell may be the same cell as source cell.

8. The candidate gNB-DU responds with a UE CONTEXT MODIFICATION RESPONSE message including the updated lower layer configuration. The candidate gNB-DU may also respond the updated CSI Report Configuration.

9. The gNB-CU sends a DL RRC MESSAGE TRANSFER message to the source gNB-DU, which includes the generated *RRCReconfiguration* message with the LTM configuration.

10. The source gNB-DU forwards the received *RRCReconfiguration* message to the UE.

11. The UE responds to the source gNB-DU with an *RRCReconfigurationComplete* message.

12. The source gNB-DU forwards the *RRCReconfigurationComplete* message to the gNB-CU via an UL RRC MESSAGE TRANSFER message.

13. Early synchronization is performed as specified in TS 38.300 [2].

14 - 15. The candidate gNB-DU sends the TA, the associated CFRA resource information, the candidate cell ID and the source gNB-DU ID to the source gNB-DU via DU-CU TA INFORMATION TRANSFER and CU-DU TA INFORMATION TRANSFER messages.

16. The UE sends the L1 measurement result to the source gNB-DU.

17. The source gNB-DU decides to execute LTM to a candidate target cell.

18. The source gNB-DU sends the Cell Switch command to the UE.

19. The source gNB-DU sends the UL CELL CHANGE NOTIFICATION message to the gNB-CU to indicate the initiation of the LTM command to the UE including the target cell ID and the TCI state ID.

20. The gNB-CU sends the target cell ID and the TCI state ID to the target gNB-DU in the DL CELL CHANGE NOTIFICATION message.

21. The target gNB-DU detects the UE access as specified in TS 38.300 [2].

22. The target gNB-DU sends the ACCESS SUCCESS message to the gNB-CU with the target cell ID.

23. The UE sends an *RRCReconfigurationComplete* message to the target gNB-DU.

1. The target gNB-DU forwards the *RRCReconfigurationComplete* message to the gNB-CU via an UL RRC MESSAGE TRANSFER message.

25. The gNB-CU may send the UE CONTEXT RELEASE COMMAND message to the source gNB-DU to release the resources of prepared cells.

26. The source gNB-DU responds with a UE CONTEXT RELEASE COMPLETE message.

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