**3GPP TSG-RAN3 Meeting #125bis *R3-24xxxx***

**Hefei, China, 14 – 18 Oct 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.401** | **CR** | **0429** | **rev** | **1** | **Current version:** | **18.3.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network |  |

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| ***Title:*** | Alignment of procedural text for LTM early sync procedure | | | | | | | | | |
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| ***Source to WG:*** | CATT, China Telecom, CMCC, Huawei, Google, Nokia, LG Electronics, Ericsson, Samsung | | | | | | | | | |
| ***Source to TSG:*** | RAN3 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_Mob\_enh2-Core | | | | |  | ***Date:*** | | | 2024-10-17 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-18 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19)  Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | There is misalignment between signaling flows and procedural text in Figure 8.2.1.4-1 and Figure 8.2.1.5-1 about LTM early synchronization procedure. | | | | | | | | |
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| ***Summary of change:*** | | * Change the step 11 in 8.2.1.4 and step 13 in 8.2.1.5 from “Early synchronization”to “Early TA acquisition”. * Change the step 13 in Figure 8.2.1.4-2 from “early” to “Early”.   Impact assessment towards the previous version of the specification (same release):  This CR has an isolated impact towards the previous version of the specification (same release).  This CR only has an impact on the LTM function.  This CR is backward compatible. | | | | | | | | |
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| ***Consequences if not approved:*** | | Ambiguities remain regarding the early synchronization procedure. | | | | | | | | |
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| ***Clauses affected:*** | | 8.2.1.4, 8.2.1.5 | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | | TS/TR ... CR ... | | |
| ***affected:*** | |  | **X** | Test specifications | | | | TS/TR ... CR ... | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | | TS/TR ... CR ... | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | v1 Aligns the procedure text with figure base on discussion | | | | | | | | |

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#### 8.2.1.4 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 8.2.1.4-1 shows the intra-gNB-DU LTM procedure for intra-NR.



Figure 8.2.1.4-1: 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 for each candidate cell, containing one candidate cell ID and the CSI resource configuration for subsequent LTM. The gNB-CU may provide the LTM configuration ID mapping list to the gNB-DU. The gNB-CU may request 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 or provide the lower layer reference configuration to the gNB-DU.

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 for the accepted candidate cell.

NOTE 1: Steps 3 and 4 may be initiated multiple times for LTM candidate cell preparation of multiple cells including the source cell.

5. The gNB-CU sends a UE CONTEXT MODIFICATION REQUEST message to the gNB-DU which may include the LTM configuration ID mapping list and/or the updated CSI resource configuration.

6. The gNB-DU responds with a UE CONTEXT MODIFICATION RESPONSE message which includes an updated lower layer configuration, e.g., containing the updated CSI report configuration of the source cell.

NOTE 2: In case of subsequent LTM, the CU-initiated UE Context Modification procedure may be invoked per each candidate cell to transfer to the gNB-DU the updated CSI resource configuration.

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

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

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

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

11. Early TA acquisition to the candidate cell(s) may be performed as specified in TS 38.300 [2].

12. The UE sends the L1 measurement result to the gNB-DU. The gNB-DU decides to execute LTM.

13. The gNB-DU sends the Cell Switch Command to the UE.

14. The gNB-DU sends the DU-CU CELL SWITCH NOTIFICATION message to the gNB-CU to indicate the initiation of the Cell Switch Command to the UE including the target cell ID.

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

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

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

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

19. The gNB-CU may send the UE CONTEXT MODIFICATION REQUEST message to the gNB-DU to release the resources of prepared cells.

20. The gNB-DU responds with a UE CONTEXT MODIFICATION RESPONSE message.

#### 8.2.1.5 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 8.2.1.5-1 shows the inter-gNB-DU LTM procedure for intra-NR.



Figure 8.2.1.5-1: Inter-gNB-DU LTM

1. The UE sends a *MeasurementReport* message (L3 measurement result) to the source gNB-DU containing measurements of neighbouring 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(s) for each candidate cell, containing one candidate cell ID and the CSI resource configuration for subsequent LTM. The gNB-CU may provide the LTM configuration ID mapping list to the candidate gNB-DU(s). The gNB-CU may request PRACH resources from the candidate gNB-DU(s). The gNB-CU may request the candidate gNB-DU(s) to provide the lower layer configuration for the purpose of generating the reference configuration or provide the lower layer part of the reference configuration to the candidate gNB-DU(s).

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 for the accepted target candidate cell.

NOTE 1: The CU-initiated UE Context Modification procedure may be initiated for preparing candidate cells in the source gNB-DU as specified in step 3 and 4 in 8.2.1.4 Intra-gNB-DU LTM.

5. The gNB-CU sends a UE CONTEXT MODIFICATION REQUEST message to the source gNB-DU including the information related to early sync and the LTM configuration ID mapping list for the accepted target candidate cell(s). The gNB-CU may send the updated CSI resource configuration to the source gNB-DU.

6. The source gNB-DU responds with a UE CONTEXT MODIFICATION RESPONSE message which includes an updated lower layer configuration, e.g., containing the updated CSI report configuration of the source cell.

7. The gNB-CU may send a UE CONTEXT MODIFICATION REQUEST message to the candidate gNB-DU(s) containing the information for subsequent LTM or for updating the configurations of candidate cells. The gNB-CU may also provide the lower layer part of the reference configuration to the candidate gNB-DU(s).

8. The candidate gNB-DU responds with a UE CONTEXT MODIFICATION RESPONSE message including the updated lower layer configuration, e.g., containing the updated CSI report configuration of the candidate gNB-DU.

NOTE 2: Step 7 may also be triggered after step 19, or after step 22 by implementation for subsequent LTM.

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 TA acquisition to the candidate cell(s) may be performed as specified in TS 38.300 [2].

14.The candidate gNB-DU sends a DU-CU TA INFORMATION TRANSFER message to the gNB-CU, which includes the TA values, and the associated PRACH resource information.

15. The gNB-CU forwards the TA value, and the associated PRACH resource information to the source gNB-DU in the CU-DU TA INFORMATION TRANSFER message.

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

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

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

19. The source gNB-DU sends the DU-CU CELL SWITCH NOTIFICATION message to the gNB-CU to indicate the initiation of the Cell Switch Command to the UE, including the target cell ID and the TCI state ID(s). The TA value(s) related information applicable for subsequent LTM may also be included.

20. The gNB-CU forwards in the CU-DU CELL SWITCH NOTIFICATION message to the target gNB-DU the target cell ID, the TCI state ID(s), and the TA value(s) related information received in step 19.

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.

24. 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.