3GPP TSG RAN WG3 Meeting #127 R3-240808

**Athens, Greece, 17 – 21 Feb, 2025**

Agenda Item: 13.3

Source: ZTE (moderator)

Title: Summary of Offline Discussion on CB: # MobilityEnh\_ConditionalLTM

Document for: Approval

# Introduction

**CB: # MobilityEnh\_ConditionalLTM**

**- discuss on whether intra-CU progress can be reused.**

**- which node to decide the conditional LTM.**

**- try to capture the further agreement and work on stage 2 and stage 3 TPs.**

(moderator-ZTE)

Offline summary in [R3-240808](file:///D%3A%5C3GPPmeeting%5C202502%20RAN3%20127%5CInbox%5CR3-240808.zip)

# For the Chairman’s Notes

**TPs to be agreed:**

R3-250875 to be agreed (38.401 ZTE)

**Agreement:**

The CU decides to configure C-LTM.

The CU determines which type of C-LTM to initiate: L1 event-triggered C-LTM or L3 event-triggered C-LTM.

Reuse the current LTM preparation procedure (i.e. UE Context Setup/Modification procedure) for DU to generate the C-LTM L1 execution condidtion.

UE Context Setup procedure for the candidate DU to generate the subsequent C-LTM L1 execution condidtion.

UE Context Modification procedure for the source DU to generate the C-LTM L1 execution condidtion.

Indicator for C-LTM shall be added in the UE CONTEXT SETUP/MODIFICATION REQUEST message. FFS for the detail.

For L1 measurement based C-LTM, to support Early Sync, the existing F1: DU-CU/ CU-DU TA Information Transfer is reused.

**Open issues:**

# Discussion- Second round

# Discussion-First round

**RAN2-127bis (Hefei, October 2024)**

**Agreements on C-LTM**

1. Source cell sends the conditional LTM configuration via RRCReconfiguration to UE, which includes the LTM candidate configurations, and the corresponding execution conditions.
2. Event LTM3-like and LTM5-like are used as the conditional LTM execution condition. FFS on reuse of CHO conditions.
3. Source cell and each candidate cell provides its own execution condition for conditional LTM.
4. It is DU to generate the L1 execution condition. FFS on a case that L3 measurement is used.
5. RACH-less Conditional intra-CU LTM is supported.
6. RACH based conditional intra-CU LTM is supported.
7. UE based TA measurement mechanism is supported for conditional intra-CU LTM.
8. PDCCH ordered early TA acquisition is supported for conditional LTM.
9. Rel-18 Early candidate TCI State activation/deactivation is supported for conditional intra-CU LTM.
10. For RACH-less conditional LTM, CG-based first UL transmission on target cell is supported. FFS on DG-based approach.
11. The LTM completion defined for Rel-18 intra-CU LTM is reused for conditional LTM.

**RAN2-128 (Orlando, November 2024)**

**Agreements on C-LTM:**

1. The triggering condition of conditional LTM can be based on L3 measurement.
2. CondEventA3 and CondEventA5 conditions can be baseline for the conditional LTM execution.
3. The L1 execution condition of a candidate cell is associated to only one triggering event.
4. For L3 execution condition, it may consist of one or two triggering condition(s). If there are two triggering conditions associated with the same candidate cell, the UE shall consider the execution condition is fulfilled only when both triggering conditions are met. Only single RS type is supported and at most two different trigger quantities can be configured simultaneously for the evaluation of execution condition of a single candidate cell.
5. To support initial and subsequent conditional LTM, the following items can be considered for the configuration of execution condition:

 - The CLTM configuration of each candidate cell shall include the execution condition for initial conditional LTM, which is generated by the initial source cell to trigger the CLTM for the candidate cell.

 - The CLTM configuration of each candidate cell may include execution conditions for subsequent conditional LTM, which is generated by the candidate cell to trigger the CLTM for other candidate cells when the candidate cell becomes a serving cell.

1. The network can configure measurement reports e.g., L1 periodic, semi-persistent, aperiodic and event triggered report, or L3 measurement reports for conditional LTM, e.g., to trigger PDCCH ordered early RACH.
2. For CLTM, the Candidate Cell TCI States Activation/Deactivation MAC CE is re-used for the early activation/deactivation of TCI state(s) of a CLTM candidate configuration.
3. The Early TA is signalled to the UE from the source cell (i.e., not from the candidate cell directly to the UE). This agreement will be included in the LS to RAN1/3/4.
4. The network can inform the candidate cell’s TA information to UE via new MAC CE, which is the TA value when UE switches to that candidate cell during CLTM.
5. Candidate cell TA is maintained by a new timer.
6. For L1-based conditional LTM the condition evaluation is at MAC level and for L3-based conditional LTM the condition evaluation is at RRC level.

## Subsequent C-LTM procedure

We suggest that subsequent C-LTM can reuse the same phases as inter-CU and SN initiated inter-CU.

**Proposal 1: The subsequent Conditional LTM procedure includes the following phases**

* **LTM Preparation**
* **LTM Execution**
* **LTM completion (including LTM Cancellation)**

[R3-250060] The following phases are considered when analysing support for Intra-CU Conditional LTM:

 **Phase # 1:** Conditional cell switch condition configuration

**Phase # 2:** Conditional cell switch condition evaluation

**Phase # 3:** Early synchronization

 **Phase # 4:** Conditional cell switch execution

Moderator’s view: It is similar phases, it does not influence our following discussion.

## Subsequent C-LTM

**Proposal 2: The subsequent C-LTM includes the following scenario (R3-250367):**

* **Intra-gNB-DU Conditional LTM**
* **Inter-gNB-DU Conditional LTM**
* **Conditional LTM with gNB-CU-UP change**

Moderator： Whether or how to capture the Conditional LTM with gNB-CU-UP change

## Subsequent C-LTM preparation phase

**C-LTM configuration**

Because for inter-CU, it is the CU to decide the C-LTM configuration, so it is reasonable that it is the CU to decide it for C-LTM.

**Proposal 3: The CU decides to configure C-LTM.**

**Proposal 3A: The CU determines which type of C-LTM to initiate: L1 event-triggered C-LTM or L3 event-triggered C-LTM.**

**Proposal 3B: Reuse the current LTM preparation procedure (i.e. UE Context Setup/Modification procedure) for DU to generate the C-LTM L1 execution condidtion.**

**UE Context Setup procedure for the candidate DU to generate the subsequent C-LTM L1 execution condidtion.**

**UE Context Modification procedure for the source DU to generate the C-LTM L1 execution condidtion.**

**Proposal 3D: Indicator for C-LTM shall be added in the UE CONTEXT SETUP/MODIFICATION REQUEST message. FFS for the detail.**

**Proposal 4: DU generates L1 execution condition, CU generates L3 execution conditions.**

[R3-250299] There are two methods for LTM cell switch procedure: Rel-18 network controlled LTM or Rel-19 conditional LTM, and both are controlled by the RRC configuration. If the network-controlled LTM method is used, the source DU needs to send the LTM cell switch command MAC CE to the UE during the cell switch procedure. However, if the conditional LTM method is used, the source DU should not send this MAC CE. Hence, the CU decides whether to initiate the Rel-18 network-controlled LTM or the Rel-19 C-LTM and sends it to the DU during LTM preparation.

Moderator: Can LTM and C-LTM be coexisting?

FFS, open

**Proposal 3E: The CU determines whether to initiate Rel-18 network-controlled LTM or Rel-19 conditional LTM, and indicates to DU in C-LTM preparation.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **LTM InformationSetup** |  | *0..1* |  |  | YES | reject |
| >LTM Indicator | M |  | ENUMERATED (true, conditional intra-CU, …) |  | - |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **LTM Information Modify** |  | *0..1* |  |  | YES | reject |
| >LTM Indicator | M |  | ENUMERATED (true, conditional intra-CU, …) |  | - |  |

**C-LTM execution conditions**

RAN2 has agreed that CLTM execution conditions can be based on L1 or L3 measurements.

5. To support initial and subsequent conditional LTM, the following items can be considered for the configuration of execution condition:

 - The CLTM configuration of each candidate cell shall include the execution condition for initial conditional LTM, which is generated by the initial source cell to trigger the CLTM for the candidate cell.

 - The CLTM configuration of each candidate cell may include execution conditions for subsequent conditional LTM, which is generated by the candidate cell to trigger the CLTM for other candidate cells when the candidate cell becomes a serving cell.

**Proposal 4: DU generates L1 execution condition, CU generates L3 execution conditions.**

**Proposal 5D: If subsequent C-LTM execution conditions are based on L1 measurements, CU notifies (source) DU to generates the L1 execution conditions.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **LTM InformationSetup** |  | *0..1* |  |  | YES | reject |
| >LTM Indicator | M |  | ENUMERATED (true, …) |  | - |  |
| >Reference Configuration | O |  | 9.3.1.292 |  | - |  |
| >CSI Resource Configuration | O |  | 9.3.1.330 |  | - |  |
| >L1 Trigger Event Indicator | O |  | ENUMERATED (true, ...) |  | YES | reject |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **LTM Information Modify** |  | *0..1* |  |  | YES | reject |
| >LTM Indicator | M |  | ENUMERATED (true, …) |  | - |  |
| >Reference Configuration | O |  | 9.3.1.292 |  | - |  |
| >CSI Resource Configuration | O |  | 9.3.1.330 |  | - |  |
| >L1 Trigger Event Indicator | O |  | ENUMERATED (true, ...) |  | YES | reject |

**Proposal 5E: Whether the L1 executions conditions should be embedded with the CSI report config or not is spending RAN2 progress [R3-250060].**

**Early Sync**

RAN2 reached several agreements on Early Sync for CLTM:

* *RACH-less Conditional intra-CU LTM is supported.*
* *RACH based conditional intra-CU LTM is supported.*
* *PDCCH ordered early TA acquisition is supported for conditional LTM.*
* *Rel-18 Early candidate TCI State activation/deactivation is supported for conditional intra-CU LTM.*
* *For CLTM, the Candidate Cell TCI States Activation/Deactivation MAC CE is re-used for the early activation/deactivation of TCI state(s) of a CLTM candidate configuration.*
* *The Early TA is signalled to the UE from the source cell (i.e., not from the candidate cell directly to the UE). This agreement will be included in the LS to RAN1/3/4.*
* *Candidate cell TA is maintained by a new timer.*
* *The network can inform the candidate cell’s TA information to UE via new MAC CE, which is the TA value when UE switches to that candidate cell during CLTM.*

**Early UL synchronization: TA Information Transfer**

For Intra/inter-CU LTM, it is the source DU’s implementation to check the validity of a received TA value. For the C-LTM, it is not sure when the UE will execute C-LTM, so that the network shall configure and inform the candidate cell’s TA information to UE.

**Proposal 7: For L1 measurement based C-LTM, to support Early Sync, the existing F1: DU-CU/ CU-DU TA Information Transfer is reused.**

As stated in [R3-250367], it is reasonable to assume that the TAT value for a candidate DU is decided by the candidate DU, i.e., the source DU does not know this value. This calls for a coordination between network nodes to support the transfer of TAT (Time Alignment Timer).

The Candidate DU generates and sends the TA value(s) to the Candidate CU, then Candidate CU forwards it to the source CU, and then source CU forwards it to the source DU.

**Proposal 7A: For C-LTM, to support Early Sync, the existing F1: DU-CU/ CU-DU TA Information Transfer is reused to transmit the TAT (Time Alignment Timer) from candidate DU(s) to source DU**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **DU to CU TA Information List** |  | *1* |  |  | YES | ignore |
| **>DU to CU TA Information Item IEs** |  | *1 .. <maxnoofTAList>* |  |  | EACH | ignore |
| >>Candidate Cell ID | M |  | NR CGI9.3.1.12 |  | - |  |
| >>TA Value | M |  | INTEGER (0..4095) | Indicates the TA value as defined in TS 38.213 [31]. | - |  |
| >>Preamble Index | M |  | INTEGER (0..63) |  | - |  |
| >>RA-RNTI | M |  | INTEGER (0..65535, ...) | RA-RNTI as defined in TS 38.321 [16]. | - |  |
| >>Source gNB-DU ID | M |  | gNB-DU ID 9.3.1.9 |  | - |  |
| >>Tag ID Pointer | O |  | OCTET STRING | Includes the *tag-Id-ptr* contained in the *TCI-UL-State* IE or the *TCI-State* IE, as defined in TS 38.331 [8]. | - |  |
| >>Time Alignment Timer | O |  | FFS |  |  |  |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **CU to DU TA Information List** |  | *1* |  |  | YES | ignore |
| **>CU to DU TA Information Item IEs** |  | *1 .. <maxnoofTAList>* |  |  | EACH | ignore |
| >>Candidate Cell ID | M |  | NR CGI9.3.1.12 |  | - |  |
| >>TA Value | M |  | INTEGER (0..4095) | Indicates the TA value as defined in TS 38.213 [31]. | - |  |
| >>Preamble Index | M |  | INTEGER (0..63)  |  | - |  |
| >>RA-RNTI | M |  | INTEGER (0..65535, ...) | RA-RNTI as defined in TS 38.321 [16]. | - |  |
| >>Tag ID Pointer | O |  | OCTET STRING | Includes the *tag-Id-ptr* contained in the *TCI-UL-State* IE or the *TCI-State* IE, as defined in TS 38.331 [8]. | - |  |
| >>Time Alignment Timer | O |  | FFS |  |  |  |

**Early DL synchronization: TCI State Configurations**

[R3-250299] After the LTM preparation stage, the next step in the conditional LTM cell switch procedure is early synchronization, which includes both DL and UL synchronization. According to RAN2 agreements, in Rel-19 conditional LTM, Rel-18 early candidate TCI state activation/deactivation for early DL synchronization is supported. The source DU sends a MAC CE to the UE to activate or deactivate candidate cell TCI states, which is also reused.

**Observation 1: The Rel-18 Candidate Cell TCI States Activation/Deactivation MAC CE is reused for early DL synchronization in C-LTM.**

In addition, the CU should collect the candidate cell TCI state configuration from both the source DU and candidate DUs during the LTM preparation stage, i.e., a *TCI States Configuration List*. This list includes all the TCI state IDs required for the early DL synchronization procedure. After collecting a comprehensive list of all possible TCI states, the CU sends it to the source DU to ensure that the early DL synchronization procedure functions correctly. Therefore, the *TCI States Configurations List* field in the UE CONTEXT SETUP RESPONSE and UE CONTEXT MODIFICATION RESPONSE messages can be reused.

**Proposal 9: Reuse the TCI States Configurations List field in the UE CONTEXT SETUP RESPONSE and UE CONTEXT MODIFICATION RESPONSE messages to collect candidate cell TCI state configuration.**

Moderator: Do we need to have signalling enhancement?

The CU will then send the candidate cell TCI state configuration to the source DU in the UE CONTEXT MODIFICATION REQUEST message. For the subsequent C-LTM cell switch, one of the candidate DUs will become the source DU and will send the candidate cell TCI States Activation/Deactivation MAC CE to the UE. As a result, the *TCI States Configurations List* field in the UE CONTEXT MODIFICATION REQUEST message should also be reused to send the configuration to both the source DU and the candidate DUs.

**Proposal 10: Reuse the TCI States Configurations List field in the UE CONTEXT MODIFICATION REQUEST message to send the candidate cell TCI state configuration to the source DU, as well as to the candidate DUs for the subsequent C-LTM.**

Moderator: Do we need to have signalling enhancement?

## Subsequent C-LTM execution phase

In inter-gNB-DU CLTM, when the UE leaves the source cell, the source DU does not know about it, and remains in a sort of limbo. It still has resources allocated for the UE, until, for example, it declares itself that the UE is lost (which is incorrect, with consequences in inaccurate observability), or until the CU releases the UE context.

A simple way to resolve the issue for inter-gNB-DU CLTM is that when the target DU detects the UE access, it informs the CU and CU forwards this information to source DU. To achieve this, it is possible to reuse already existing F1AP messages: first the target DU sends to CU a DU-CU CELL SWITCH NOTIFICATION message (to indicate the target cell ID), and then CU forwards the information to source DU in a CU-DU CELL SWITCH NOTIFICATION message.

RAN2 agreement :

1. For RACH-less conditional LTM, CG-based first UL transmission on target cell is supported. FFS on DG-based approach.

[R3-250299] Based on the RAN2 agreements above, the CG-based first UL transmission on the target cell is supported for RACH-less conditional LTM, while the DG-based approach is still under discussion. For the DG-based approach of C-LTM, there is no cell switch command from the source DU to the UE. The source DU does not know when the UE will perform the LTM cell switch procedure, so the timing of the DU-CU CELL SWITCH NOTIFICATION and CU-DU CELL SWITCH NOTIFICATION remains FFS, pending further progress from RAN2.

Moderator: Which proposal is fine?

Proposal 11: RAN3 to discuss possible solutions on how to inform source DU that UE has left the source cell.

**Proposal 11A: Wait for RAN2 progress on whether and when the DU-CU CELL SWITCH NOTIFICATION and CU-DU CELL SWITCH NOTIFICATION will be performed.**

## Subsequent C-LTM completion phase

RAN2 agreement:

11. The LTM completion defined for Rel-18 intra-CU LTM is reused for conditional LTM.

Proposal 12: C-LTM completion reuses the existing LTM network signaling.

**Proposal 12A: The target DU sends the ACCESS SUCCESS message to the CU after the UE successfully accesses the target cell.**

## Stage 2 procedure

**Discuss on whether intra-CU progress can be reused.**

The following procedures are modified based on the latest 38.401, the yellow highlighted text is for the conditional LTM.

#### 8.2.1.x Conditional intra-CU LTM (Intra-gNB-DU)

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



Figure 8.2.1.x-1: Conditional intra-CU LTM (Intra-gNB-DU)

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 conditional intra-CU 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. The gNB-CU may inform the gNB-DU about intra-DU L2 reset configuration. The gNB-CU provide an indicator for conditional intra-CU LTM and may provide an indicator to configure L1 Trigger Event

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 conditional LTM candidate cell preparation of multiple cells including the source cell.

*Editor’s Note: Details are FFS on step 3 and 4.*

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. The gNB-CU may inform the gNB-DU about intra-DU L2 reset 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 conditional intra-CU 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.

*Editor’s Note: FFS on whether step 5 and 6 are mandatory or optional and FFS on the details.*

7. The gNB-CU sends a DL RRC MESSAGE TRANSFER message to the gNB-DU, which includes the generated *RRCReconfiguration* message with the conditional intra-CU 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 gNB-DU sends the MAC CE to the UE including the TA value(s) and TAT value(s) related information of the candidate cell(s). (Can be refined by RAN2 progress)

13. The execution condition to trigger initiation of conditional LTM is fulfilled.

14. Conditional intra-CU LTM is executed.

*Editor’s note: RAN3 to discuss possible solutions on how to inform source DU that UE has left the source cell.*

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

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

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

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

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

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#### 8.2.1.y Conditional intra-CU LTM (Inter-gNB-DU)

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 subsequent Conditional intra-CU LTM. Figure 8.2.1.y-1 shows the inter-gNB-DU Conditional intra-CU LTM procedure for intra-NR.



Figure 8.2.1.y-1: Conditional intra-CU LTM (Intra-gNB-DU)

1. 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 conditional intra-CU 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 conditional intra-CU 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). The gNB-CU provide an indicator for conditional intra-CU LTM and may provide an indicator to configure L1 Trigger Event.

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 conditional intra-CU 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. The gNB-CU may inform the source gNB-DU about intra-DU L2 reset configuration.

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 for each candidate cell accepted in the candidate gNB-DU(s), containing the information for subsequent conditional intra-CU 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). The gNB-CU may inform the candidate gNB-DU(s) about intra-DU L2 reset configuration.

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 requested candidate cell.

NOTE 2: Step 7 may also be triggered after step 18 for subsequent conditional intra-CU 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 conditional intra-CU 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 TAT values, and the associated PRACH resource information.

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

16. The source gNB-DU sends the MAC CE to the UE including the TA value(s) and TAT values information of the candidate cell(s) (Can be refined by RAN2 progress)

17. The execution condition to trigger initiation of conditional LTM is fulfilled.

18. Conditional intra-CU LTM is executed.

*Editor’s note: RAN3 to discuss possible solutions on how to inform source DU that UE has left the source cell.*

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

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

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

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

# Conclusion, Recommendations

# References

1. R3-250367 Intra-CU Conditional LTM (Ericsson) discussion
2. [R3-250645](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250645.zip) Discussions on RAN3 impacts from Conditional Intra-CU LTM (LG Electronics Inc.) discussion
3. [R3-250342](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250342.zip) (TP for TS38.401) On support of intra-CU Conditional LTM (China Telecom) other
4. [R3-250191](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250191.zip) signaling enhancements for Conditional Intra-gNB/Intra-CU LTM (Qualcomm Incorporated) discussion
5. [R3-250585](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250585.zip) Discussion on Conditional LTM (Samsung) discussion
6. [R3-250285](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250285.zip) [TP to BL CR for TS 38.401] Support for conditional intra-CU LTM (Lenovo) other
7. [R3-250060](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250060.zip) Discussion on Conditional LTM in disaggregated gNB architecture (Nokia) discussion
8. [R3-250162](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250162.zip) Discussion of Rel-19 intra-CU Conditional LTM (NEC) discussion
9. [R3-250299](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250299.zip) (TP for LTM BLCR for TS38.473): Comprehensive analysis of intra-CU conditional LTM (Huawei) other
10. [R3-250417](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250417.zip) (TP to 38.473,38.401)Discussion for C-LTM (CATT) discussion
11. [R3-250646](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250646.zip) (TP for NR\_Mob\_Ph4 TS 38.401 and TS 38.473) Conditional LTM (LG Electronics Inc.) other
12. [R3-250703](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_127%5CDocs%5CR3-250703.zip) TP to TS 38.401 on conditional intra-CU LTM (ZTE Corporation) Other

## LTM execution



STEP 1: UE takes the L1/L3 measurements to evaluate the CLTM event to determine whether a CLTM cell switch is triggered or not.

STEP 2: UE generates and sends the Cell Switch Notification message by UL MAC CE to the serving cell if the event for CLTM is evaluated as met and there is at least one candidate cell can be selected as the CLTM target cell.

STEP 2a: The serving DU will forward the received Cell Switch Notification message to the target DU via gNB-CU.

STEP 3: UE may receive the ACK message by DL MAC CE to respond the Cell Switch Notification message.

STEP 4: UE performs intra-CU conditional LTM Cell Swith to the target cell and applies the candidate configuration indicated by the target configuration ID.

STEP 5a: If no CG resource is allowed, UE initiates the RACH procedure for CLTM to the candidate cell.

STEP 5b: If CG resource is available, UE generates the first UL transmission by using the configured grant to the candidate cell.

STEP 6: UE starts to subsequent CLTM Completion.