**3GPP TSG-RAN WG3 Meeting #123 R3-240960**

**Athens, GR, 26 Feb – 01 Mar, 2024**

Agenda Item: 9.1.5.1

Source: Huawei

Title: Summary of offline discusison for LTM

Document for: Discussion

# Introduction

This document contains the summary of offline discussion for the following CB.

**CB: # 34\_MobilityEnh-LTM**

**- check with above identified issues.**

**- capture the agreements in stage-2 and stage-3.**

**- for the other open issues, capture the essential corrections in high priority.**

(moderator - HW)

Summary of offline dis in R3-240960

# Proposals for Chair notes

# Discussion

## Remaining issues

See details in chair notes and R3-240926.

## Corrections

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|  **LTM stage2/3** |
| [R3-240701](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240701.zip) | Corrections to TS 38.470 to support LTM (ZTE, Ericsson, Huawei, CATT)Agreed. Add Nokia as cosource. | CR0135r, TS 38.470 v18.0.0, Rel-18, Cat. F |
| [R3-240552](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240552.zip) | Essential corrections for LTM in stage-2 (Ericsson)Remove the description on omitting source gNB-DU ID in the CU-DU TA Information Transfer procedures. | draftCR |
| [c](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240469.zip) | Stage 2 update for LTM (Huawei)For section 8.2.1.4 Intra-gNB-DU LTM:* In the figure, after step 12, change “Inter-cell Mobility Execution Decision” to “LTM Cell Switch Decision” to align to the inter-gNB-DU LTM.
* In step 3, add “may” in sentence “The gNB-CU requests PRACH resources from the gNB-DU”, and add “The gNB-CU may xxx, or provide the lower layer reference configuration to the gNB-DU” in the end of next sentence.
* In step 5, remove “and the gNB-CU may send the CSI report configuration for all the accepted target candidate cells”, and add a new sentence “The gNB-CU may send the updated CSI resource configuration to the source gNB-DU.”
* ADD the statement in step 3 for intra DU an inter DU cases.in 0050.

for each candidate cell, | CR0349r, TS 38.401 v18.0.0, Rel-18, Cat. F |
| [R3-240702](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240702.zip) | Corrections to TS 38.401 to support LTM (ZTE) | CR0360r, TS 38.401 v18.0.0, Rel-18, Cat. F |
| [R3-240507](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240507.zip) | Correction on LTM procedure (CMCC) | CR0354r, TS 38.401 v18.0.0, Rel-18, Cat. F |
| [R3-240201](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240201.zip) | Correction on LTM (Lenovo) | CR0332r, TS 38.401 v18.0.0, Rel-18, Cat. F |
| [R3-240322](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240322.zip) | Correction on stage 2 LTM (CATT) | CR0341r, TS 38.401 v18.0.0, Rel-18, Cat. F |
| [R3-240356](file:///C%3A%5C%5CUsers%5C%5CZhang%20Hongzhuo%5C%5CDesktop%5C%5CDocs%5C%5CR3-240356.zip) | Correction of Rel-18 Intra-CU LTM stage-2 descriptions (LG Electronics Inc.) | CR0343r, TS 38.401 v18.0.0, Rel-18, Cat. F |
| [R3-240444](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240444.zip) | Corrections for LTM (Google Inc.) | CR0348r, TS 38.401 v18.0.0, Rel-18, Cat. F |
| [R3-240122](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240122.zip) | Correction for early sync of LTM (NEC) | CR0325r, TS 38.401 v18.0.0, Rel-18, Cat. F |
| [R3-240189](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240189.zip) | (CR to 38.401) Corrections on LTM procedures (China Telecommunication) | CR0330r, TS 38.401 v18.0.0, Rel-18, Cat. F |
| [R3-240472](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240472.zip) | Stage 2 update for remaining issues for LTM (Huawei) | CR0350r, TS 38.401 v18.0.0, Rel-18, Cat. F |
| [R3-240325](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240325.zip) | Introduce UL TCI state ID in the cell switch notification (CATT,ZTE,CMCC)merged | CR1296r, TS 38.473 v18.0.0, Rel-18, Cat. F |
| [R3-240553](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240553.zip) | Essential corrections for LTM over F1 (Ericsson)Check RAN2 with the following change in this week:With regards to TCI information, given RAN2's discussion of defining a new RRC IE containing more info regarding TCI states, it is suggested that upon consensus, the current TCI lists over F1 is replaced by an OCTET STRING referencing the new RRC container | CR1335r, TS 38.473 v18.0.0, Rel-18, Cat. F |
| [R3-240202](file:///C%3A%5C%5CUsers%5C%5CZhang%20Hongzhuo%5C%5CDesktop%5C%5CDocs%5C%5CR3-240202.zip) | Correction on LTM (Lenovo) | CR1272r, TS 38.473 v18.0.0, Rel-18, Cat. F |
| [R3-240445](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240445.zip) | Correction for mobility enhancement (Google Inc.)* Check with henrik about the default behaviour of receving IEs already have.
* The exact references for the CandidateTCI-State and the TCI-StateId in TS 38.331 are not correctly captured
 | CR1316r, TS 38.473 v18.0.0, Rel-18, Cat. F |
| [R3-240323](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240323.zip) | Correction on stage 3 LTM (CATT)put the TCI state configuration list out of early sync information.*TCI state information* IE should always include in the LTM Cell Switch Information, this IE should be mandatory. | CR1295r, TS 38.473 v18.0.0, Rel-18, Cat. F |
| [R3-240703](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240703.zip) | Corrections to TS 38.473 to support LTM (ZTE) | CR1354r, TS 38.473 v18.0.0, Rel-18, Cat. F |
| [R3-240121](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240121.zip) | Correction for early sync of LTM (NEC) | CR1255r, TS 38.473 v18.0.0, Rel-18, Cat. F |
| [R3-240357](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240357.zip) | Rel-18 LTM correction for UE-based TA measurement configuration from CU to DU (LG Electronics Inc.) | CR1299r, TS 38.473 v18.0.0, Rel-18, Cat. F |
| [R3-240473](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240473.zip) | Stage 3 update for remaining issues of LTM (Huawei) | CR1322r, TS 38.473 v18.0.0, Rel-18, Cat. FMove to 9.1.5.1 |
| [R3-240059](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240059.zip) | Correction for early TA acquisition for LTM (Nokia, Nokia Shanghai Bell) | CR1251r, TS 38.473 v18.0.0, Rel-18, Cat. FMove to 9.1.5.1 |
| [R3-240236](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240236.zip) | CR on remaining issues of LTM (Samsung) | CR1277r, TS 38.473 v18.0.0, Rel-18, Cat. FMove to 9.1.5.1 |
| *9.1.5.2. ASN.1 review***QUOTA: 2** |
| [R3-240070](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240070.zip) | Review of the description of the S-CPAC solution (Nokia, Nokia Shanghai Bell) | CR1116r, TS 38.423 v18.0.0, Rel-18, Cat. F |
| [R3-240321](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240321.zip) | ASN.1 correction for LTM (CATT) | CR1294r, TS 38.473 v18.0.0, Rel-18, Cat. F |
| [R3-240470](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240470.zip) | Stage 3 update for LTM (Huawei) | CR1321r, TS 38.473 v18.0.0, Rel-18, Cat. F |
| [R3-240554](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240554.zip) | Correction on the S-CPAC Multiple Target SN List (Ericsson) | CR1186r, TS 38.423 v18.0.0, Rel-18, Cat. F |
| [R3-240555](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CDesktop%5CDocs%5CR3-240555.zip) | Correction on the LTM Cells To Be Released List (Ericsson) | CR1336r, TS 38.473 v18.0.0, Rel-18, Cat. F |

## Rest of remaining issues

#### Issue 7: RACH Resource Prioritization for LTM Recovery

**Nokia：**

***Proposal 12: CFRA/CBRA resources for LTM recovery are not explicitly configured to the UE in addition to CFRA/CBRA resources for LTM handover.***

***Proposal 13: Target gNB-DU indicates over F1AP to gNB-CU if configured CFRA resources are shared or not.***

#### Issue 8: CFRA resource for the RACH based access

**CATT:**

**Proposal 5: DU provides CFRA resource related information to CU by the UE CONTEXT MODIFICATION RESPONSE message (inter-DU) or the UE CONTEXT SETUP RESPONSE message (intra-DU case).**

**Proposal 6: CU provides the collected CFRA resource related information from all the candidate cells to DU by the UE CONTEXT MODIFICATION REQUST message.**

**Proposal 7: CU provides all the received CFRA resource to the source DU by the UE CONTEXT MODIFICATION RESPONSE message**

**Proposal 8: Whether provide CFRA resource is pend on DU, CU no needs to request the CFRA resource explicitly.**

#### Issue 9: Transferring Candidate Cell Configuration:

E///:

a design limitation arises: the DU cannot include both the CellGroupConfig for PCell reconfiguration and the CellGroupConfig of the candidate cell at the same time.

Proposal 6: Introduce a new IE named LTM Candidate Cell Configuration in the UE CONTEXT SETUP RESPONSE and UE CONTEXT MODIFICATION RESPONSE messages.

#### Issue 10: Removing the source gNB-DU ID:

E:/// Proposal 7: Remove the source gNB-DU ID in the CU-DU TA INFORMATION TRANSFER message, and update stage-2 accordingly.

#### Issue 11: LTM Interworking with NR-DC

Nokia:

***Proposal 5: MN and SN cannot perform simultaneous LTM configuration.***

* Scenario 1: NR-DC configured, LTM is configured in MN (MCG)
* Scenario 2: NR-DC configured, LTM is configured in SN (SCG)

**Solutions for avoiding simultaneous LTM configuration at MN (MCG) and SN (SCG)**

***Proposal 6: In case of NR-DC, MN indicates to SN whether MN has decided to configure LTM in MCG.***

***Proposal 7: In case of NR-DC, MN indicates to SN when LTM in MCG has been released.***

***Proposal 8: In case of NR-DC, SN indicates to MN whether SN has decided to configure LTM in SCG.***

***Proposal 9: In case of NR-DC, SN indicates to MN when LTM in SCG has been released***

**Another variation of Scenario 1: Intra-SN L3 based PSCell change when LTM is configured in MN (MCG)**

***Proposal 10: In case of NR-DC, if LTM is configured in MCG, the SN will indicate to MN that a PSCell change decision has taken place.***

***Proposal 11: In case of NR-DC, if LTM is configured in MCG, the SN will explicitly provide the updated SCG after PSCell change.***

#### Issue 12: L3 HO with configured LTM

Samsung:

**Proposal 2-1: the CSI resource configuration IE is put outside of LTM information setup/modify IE since such IE is needed when preparing LTM candidate cell, L3 HO target cell and target PSCell.**

**Proposal 2-2: during the preparation of L3 HO/PSCell change, the UE context setup request message should contain “Early Sync Information List” IE if the LTM configuration is kept at the UE side.**

**Proposal 2-3: the stage-2 flow chart on L3 HO can be updated to reflect the LTM related configurations.**

#### Issue 13: L2 no reset configuration

Samsung:

It is common understanding that the L2 reset should be applied for inter-DU cell switch.

**Proposal 3-1: RAN3 is kindly agree that the ServingCellNoReset ID and noResetID are needed for the gNB-DU.**

#### Issue 14: Other Issues may impact on ASN.1

E:///

a design limitation arises: the DU cannot include both the CellGroupConfig for PCell reconfiguration and the CellGroupConfig of the candidate cell at the same time.

Proposal 6: Introduce a new IE named LTM Candidate Cell Configuration in the UE CONTEXT SETUP RESPONSE and UE CONTEXT MODIFICATION RESPONSE messages.

CATT:

**Proposal 1: Remove the unnecessary *LTM configuration ID* IE and *LTM Configuration mapping list ID* IE. E.g., *LTM configuration ID* IE in UE context setup/modification request message, *LTM Configuration Mapping List ID* IE in the UE context setup request message.**

**Proposal 2: Change the “TCI State ID” in “LTM Cell Switch Information” IE to “Joint or DL TCI State ID” IE, and add a “UL TCI State ID” IE for Separate TCI state case.**

**Proposal 3: Change the “L*TM Cell Switch Information* IE” in “*LTM Cell Switch Information*” IE to Manditory as the TCI state information should also be transferred from source DU to target DU.**

# Conclusion

# Reference

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|  **LTM Remaining Issues** |
| [R3-240471](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5C05DEGQ3K%5CDocs%5CR3-240471.zip) | Discussion on LTM remaining issues (Huawei) | discussion |
| [R3-240551](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5C05DEGQ3K%5CDocs%5CR3-240551.zip) | Discussion on essential corrections for LTM (Ericsson) | discussion |
| [R3-240050](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5C05DEGQ3K%5CDocs%5CR3-240050.zip) | Discussion on Remaining Issues for LTM (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-240065](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5C05DEGQ3K%5CDocs%5CR3-240065.zip) | Remaining issues in LTM (Qualcomm Incorporated) | discussion |
| [R3-240324](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5C05DEGQ3K%5CDocs%5CR3-240324.zip) | Further clarification about the unclearly point in LTM (CATT) | discussion |
| [R3-240235](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5C05DEGQ3K%5CDocs%5CR3-240235.zip) | Discussion on Remaining issues of LTM (Samsung) | DiscussionMove to 9.1.5.1 |
| [R3-240089](file:///C%3A%5CUsers%5CZhang%20Hongzhuo%5CAppData%5CLocal%5CMicrosoft%5CWindows%5CINetCache%5CContent.Outlook%5C05DEGQ3K%5CDocs%5CR3-240089.zip) | Open issues during resource reservation during LTM (Rakuten Mobile, Inc) | discussion |