3GPP TSG-RAN WG3 #119bis-e R3-231884

Online, Apr 17th – Apr 26th, 2023

**Agenda item: 14.2**

**Source: Huawei (rapporteur)**

**Title: Summary of offline discussion for CB: # MobilityEnh2\_L1L2Mobility**

**Document for: Discussion**

# 1 Introduction

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

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| **CB: # MobilityEnh2\_L1L2Mobility****- Summary on pros and cons of candidate cell suggestion using one or multiple messages.****- Discuss on data transmission,** **i.e. introduce new message or reuse legacy message. how to define d new message, and identify which legacy message to be reused.****- How to avoid HO collision between the LTM and the L3 based inter-cell mobility.****- Discuss on subsequent LTM procedure, i.e. subsequent LTM with RACH or without RACH.****- Discuss on releasing of candidate cells, reference configuration, DDDS, releasing of candidate cells,** **TA Acquisition.****- E1 interface issue, i.e. intra-CU-UP LTM and inter-CU-UP LTM?****- Capture all the agreements for above issues and prepared for the draft CRs of TS 38.401(HW), TS 38.473(E///).** (moderator - HW)Summary of offline disc R3-231884 |

# 2 Proposals for chair notes.

# 3 Discussion

Here is the list of topics summarized by chair to be discussed in this CB:

* Summary on pros and cons of candidate cell suggestion using one or multiple messages.
* Discuss on data transmission, i.e. introduce new message or reuse legacy message. how to define d new message, and identify which legacy message to be reused.
* How to avoid HO collision between the LTM and the L3 based inter-cell mobility.
* Discuss on subsequent LTM procedure, i.e. subsequent LTM with RACH or without RACH.
* Discuss on releasing of candidate cells, reference configuration, DDDS, releasing of candidate cells, TA Acquisition.
* E1 interface issue, i.e. intra-CU-UP LTM and inter-CU-UP LTM?
* Capture all the agreements for above issues and prepared for the draft CRs of TS 38.401(HW), TS 38.473(E///).

Note that TA acquisition is related to the RAN1 LS, and it will be discussed in the other CB in this AI.

And reference configuration issue is more related to RAN2 and moderator proposes to wait for more RAN2 progress before discussing it in RAN3. Hope the authors of those proposals to understand.

#### 3.1 Issue 1: Candidate cells configuration in one message or multiple message

Below are the companies views on this issue at last meeting,

* **Option 1: One message: HW, E///, ZTE, LENOVO, CMCC, QC, LG, CT**
* **Option 2: multiple messages: INTEL, NOKIA, CATT, SAMSUNG, NEC, GOOGLE**

Papers in R3-231315, R3-231447, R3-231459, R3-231510, R3-231573, and R3-231848 express support to option 1. While paper in R3-231751, think that option 2 should be adopted to minimize the spec impact. R3-231807 thinks that either option is fine. R3-231747 proposes a compromised solution as following.

* **Option 3: Both options are supported. In case that a list of candidate cells is inc luded, the DU responds to the CU with the accepted candidate cells which have the same admitted result for DRBs.**

After read all papers related to this issue, the moderator thinks that there are no any new arguments brought up which can be used to make a final decision. And it seems that companies still keep their positions no change as last meeting.

Keeping it in mind that much more F1AP signalling requirements will be needed for L1 measurement configuration and early TA acquisition according to the LS in R3-231107 (discussed in another CB), let’s check companies views once again to see if we can converge.

**Q 3.1-1: Which option do you prefer among option 1, 2 and 3?**

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| Companies | Your company view on above question | Comments if any |
| Google | Option 2 is preferred | There is no actual problem to adopt Option 2 as it already works for R-17;As for skipping the reference configuration issue, there had been sufficient RAN2 progress in this topic (i.e., agreements and running CRs) and as RAN2 does not handle the F1 interface, we should have some discussion as well.  |
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#### 3.2 Data transmission

In this section, we will discuss, i.e. introduce new message or reuse legacy message, how to defined new message, and identify which legacy message to be reused, probably also the DDDS handling as this relates to the data transmission.

RAN3 has agreed that the gNB-DU will notify the gNB-CU about the LTM initiation with a F1AP message. And it is still FFS on whether to use a new message or legacy message.

To summarize the proposals in papers in R3-231182, R3-231447, R3-231459, R3-231510, R3-231573, R3-231652, R3-231678, R3-231747, R3-231807, and R3-231848, the following options are on the table:

* **Option 1: New F1 message , class 1 or class 2, like “LTM CELL CHANGE NOTIFICATION”.**
* **Option 2: Legacy message, i.e., “UE Context Modification Required message”**

Note that as we have agreed to design common messages for both intra-DU LTM and inter-DU LTM. Therefore, above options covers the two use cases.

**Q 3.2-1: Which option do you prefer between option 1, and option 2?**

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| Companies | Your company view on above question | Comments if any |
| Google | Option 2 is preferred |  |
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**DDDS:**

The following proposals are made by companies’ papers about DDDS:

**Proposal 3.2-1: For intra-DU LTM, DDDS from gNB-DU to CU-UP is not needed for those DRBs RLC is not re-established.**

**Proposal 3.2-2: For intra-DU LTM, the gNB-DU sends a DDDS frame about unsuccessfully transmitted downlink data to the gNB-CU after LTM cell switch if RLC reestablishment is configured.**

**Proposal 3.2-3: For inter-DU LTM, the DDDS should be sent from source gNB-DU to CU-UP when the LTM cell switch command is sent. Then the CU-UP can start forwarding the unsuccessfully transmitted data to target gNB-DU.**

**Proposal 3.2-4: For both intra-DU and intra-CU inter-DU LTM, target gNB-DU sends initial DDDS using the new UL TEID to CU-UP after target gNB-DU detects the UE access**

Q**3.2-1: Any comments on above proposals:**

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| Companies | Your company view on above question | Comments if any |
| Google | OK with the proposals  |  |
|  |  |  |

**Agreements clarification:**

RAN3 made the following agreement on TEID assignment at RAN3#118 meeting which is same as the legacy.

|  |
| --- |
| **For intra-DU LTM, the gNB-CU assigns a new UL GTP TEID for each DRB and provides it to the gNB-DU via UE Context Modification Request message(s). The gNB-DU assigns the new DL GTP TEIDs per DRB per candidate cell (whether it should be per candidate cell needs to be further discussed) and provides them back to the gNB-CU in UE Context Modification Response message(s).****For inter-DU LTM, the gNB-CU assigns a new UL GTP TEID for each DRB and provides it to the target gNB-DU via UE Context Setup Request message(s). The target gNB-DU assigns the new DL GTP TEIDs per DRB per candidate cell (whether it should be per candidate cell needs to be further discussed) and provides them back to the gNB-CU in UE Context Setup Response message(s).** |

One thing which may be different from the legacy is that RAN2 agreed that the L2 can be continued without RLC re-establishment and PDCP recovery which is controlled by network as shown below.

|  |
| --- |
| * **R2 assumes that L2 is continued whenever possible (e.g. intra-DU), without Reset, with the target to avoid data loss, and the additional delay of data recovery.**
* **R2 assumes that at L1L2 cell switch: Whether the UE performs partial or full MAC reset (FFS what partial reset is, e.g. to avoid data loss), re-establish RLC, perform data recovery with PDCP is explicitly controlled by the network. R2 assumes that this can be configured by RRC. FFS if MAC CE indication(s) is/are needed.**
 |

For UL GTP-U tunnel switching, it is clear that if RLC is re-established, the gNB-DU shall continue sending UL PDCP PDUs to the gNB-CU using the previous UL GTP TEID until RLC is re-established which is the same as legacy. The new case needs to clarify is when to switch the UL GTP tunnel in case of RLF is not re-established.

Similar issue exits for the PDCP recovery case for DL. The proposal from company paper is that:

**Proposal 3.2-5: For intra-DU LTM, if RLC is not re-established, the gNB-DU shall continue sending UL PDCP PDUs to the gNB-CU using the previous UL GTP TEID until cell switch command, and after then start sending using the new UL GTP TEID.**

**Proposal 3.2-6: For intra-DU LTM, if PDCP data recovery is not configured, the gNB-CU shall continue sending DL PDCP PDUs to the gNB-DU using the previous DL GTP TEID until it receives the LTM signalling from DU, and after then start sending using the new DL GTP TEID.**

**Q3.2-1: Any comments on above proposals:**

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| Companies | Your company view on above question | Comments if any |
| Google | OK with the proposals |  |
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#### 3.3 Handover collision avoidance between LTM and L3 handover

In R3-231182, it is observed that blindly prioritizing LTM over L3-mobility leads to handover to wrong cells or ping pongs. In R3-231573, R3-231745 and R3-231458, it thinks that the priority of mobility should not be fixed. R3-231573, and R3-231458 proposes to leave the coexistence issue up to network implementation. R3-231745 and R3-231381 provide a set of proposals to clarify the network nodes behaviours in three cases. And R3-231652 proposes to wait for RAN2 decision on the priority.

In summary, the following options for the LTM and L3 handover co-existence are on the table.

* **Option 1: OAM configured priority.**
* **Option 2: Network decides the priority based on scenario (intra-gNB-CU or inter-gNB-CU) and some assistance information (the measurement results, candidate target cells).**
* **Option 3: Flexible priority. The handover triggered first take the high priority.**

For option 3, The detailed description would be:

* **Case 1,** **L3 handover triggered earlier than LTM (the gNB-DU receives the L3 handover command before LTM is triggered), L3 handover has high priority.**
* **Case 2, LTM triggered earlier than L3 (the gNB-CU receives the LTM notify message from gNB-DU before L3 handover is triggered), LTM has high priority,**
* **Case 3, LTM and L3 handover are triggered almost simultaneously (cross signallings on F1). The (source) gNB-DU fails the L3 handover by responding with UE Context Modification Failure message with proper cause meaning LTM has high priority. This is to avoid to cancel the LTM command already sent to the UE which seems complex from moderator point of view.**

The moderator also thinks that OAM configured fixed priority is sub-optimal and should be excluded firstly. For option 2, the question needs to clarify is that the gNB-DU may not know the incoming L3 handover is for intra-CU or inter-CU based on the received UE Context Modification Request (with RRC L3 handover command).

With above understanding, the moderator would like to draw the following questions:

**Q3.3-1: Which option do you prefer (option 2 or option 3) for LTM and L3 handover co-existence?**

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| --- | --- | --- |
| Companies | Your company view on above question | Comments if any. |
| Google | Option 3 |  |
|  |  |  |

#### 3.4 Candidate cell modify and release

Quite lots of papers (R3-231182, R3-231315, R3-231447, R3-231573, R3-231745, R3-231747, R3-231807, R3-231813, and R3-231848) address the candidate cells modification and release issue.

All the proposals seem similar. Therefore, the moderator summarizes all the proposals as following:

**Proposal 3.4-1: The gNB-CU may modify or release L1/2 Triggered Mobility (LTM) candidate cells in the gNB-DU.**

**Proposal 3.4-2: The gNB-DU may cancel already configured L1/2 Triggered Mobility (LTM) candidate cells.**

Note that although some proposals are made towards to the LTM completion phase, the moderator thinks that the above proposals should be applicable also to the LTM configuration phase.

**Q3.4-1: Are above proposals from moderator agreeable?**

Comments or wordings to above proposals, please provide here.

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| --- | --- | --- |
| Companies | Your company view on above question | Comments if any. |
| Google | OK with the proposals |  |
|  |  |  |

If the answer of Q3.4-1 is yes, the messages to be used for candidate cells modification and release should be decided. The moderator provides the following proposals based on the papers addressed this issue.

**Proposal 3.4-3: The gNB-CU may use the UE Context Modification procedure to modify or release the prepared resources of candidate cells in the gNB-DU and use the UE Context Release procedure to release the UE context in the gNB-DU.**

**Q3.4-2: Are above proposal from moderator agreeable?**

Comments or wordings to above proposal, please provide here.

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| --- | --- | --- |
| Companies | Your company view on above question | Comments if any. |
| Google | Yes |  |
|  |  |  |

For the gNB-DU initiated candidate cells release (de-configuration), R3-231182 provides the following options and propose to adopt option 2b:

* Option 1a: Reuse of gNB-DU Initiated UE Context Modification procedure (i.e. UE CONTEXT MODIFICATION REQUIRED message).
* Option 1b: Similar to Option 1a, but with introduction of a new F1AP procedure requesting LTM target candidate cells DE-configuration.
* Option 2a. Have the gNB-DU directly DE-configure the LTM target candidate cells. That is, the gNB-DU signals the UE via an L1 message the target candidate cells to be DE-configured. Likewise, the gNB-DU removes the resources utilized for the LTM target candidate cells, and informs the gNB-CU the target candidate cells that have been DE-configured (likely via a new F1AP message).
* Option 2b: Similar to Option 2b, in that gNB-DU could DE-configure the target cells from itself. However, with difference that gNB-DU then signals the target cells that were de-configured to the gNB-CU, and it is kept a gNB-CU responsibility to build an appropriate RRC message and update the configuration to the UE.

Although, the majority view among the papers seems to prefer option 1a, the moderator would like to draw the following question:

**Q3.4-2: Which option do you prefer for the gNB-DU initiated candidate cells release?**

Comments or wordings to above proposal, please provide here.

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| --- | --- | --- |
| Companies | Your company view on above question | Comments if any. |
| Google | Option 1a  |  |
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If Q3.4-2’s answer is option 1a, the moderator would like to check companies view on below proposal:

**Proposal 3.4-4:** **The gNB-DU may use the UE Context Modification Required procedure to request to cancel the prepared resources of candidate cells in the gNB-DU and use the UE Context Release Request procedure to request to release the UE context in the gNB-DU.**

**Q3.4-3: Are above proposal from moderator agreeable?**

Comments or wordings to above proposal, please provide here.

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| Companies | Your company view on above question | Comments if any. |
| Google | Yes |  |
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#### 3.5 Subsequent LTM

Regarding to subsequent LTM, below is the previous agreement that RAN3 made:

RAN3 works on the same signaling procedure for both initial cell switch and subsequent cell switch for intra-DU L1/L2 handover.

And among the papers in R3-231315. R3-231510, R3-231678, R3-231745, R3-231807, and R3-231813 in this meeting, the following issues and proposals are raised:

**Q3.5-1: When subsequent LTM is configured?**

* **Option 1: Subsequent LTM is configured together with initial LTM.**
* **Option 2: Subsequent LTM is configured after each LTM completion. E.g., when the gNB-CU receives the Access Success message from (target) gNB-DU,**

The point of option 1 is that RAN2 has agreed that there is no further RRC reconfigurations for subsequent LTM after initial LTM. Therefore, the configurations required for subsequent LTM should be prepared together with initial LTM. The configuration for initial LTM and subsequent LTM is sent to UE in the same RRC reconfiguration message for the first LTM preparation.

Then subsequent LTM can be executed multiple times referring to the execution part of the stage 2 procedure as captured in BLCR (i.e. step 9 ~ step 13, including L1 measurement reporting, LTM cell switch notify and ACCESS SUCCESS message).

While option 2 thinks that after each LTM, the CU may transmit a UE Context Modification Request to indicate to the DU to keep resources associated with a subset of the candidate cells for subsequent LTM. And it is pending to RAN2 discussion as there is UE impact.

Comments and answers to above question, please provide here.

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| --- | --- | --- |
| Companies | Your company view on above question | Comments if any. |
| Google | Option 1 | As answered in section 3.4, the candidate cells may be modified or released by the CU or DU and the left candidate cells can be used for subsequent LTM |
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**Q3.5-2: Which node decides the candidate cells to support LTM?**

There is only 1 proposal to propose the gNB-CU to decide.

**Proposal 3.5-2: the gNB-CU decides whether or which candidate cells need support sequential LTM.**

**Proposal 3.5-3: Candidate gNB-DU can accept/reject the request for support subsequent cell switch from the gNB-CU.**

**Proposal 3.5-4: Introduce sequential cell switch supported indicator in the UE context setup/modification request message, whether it is per cell or pre node is still FFS.**

Comments on above question and proposals, please provide here.

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| --- | --- | --- |
| Companies | Your company view on above question | Comments if any. |
| Google | OK with the proposals 3.5-2 and 3.5-3. | Not sure if proposal 3.5-4 is needed |
|  |  |  |

The third question that the moderator thinks needs to clarify is about the option 1 in Q3.4-1:

**Q3.5-3: How to indicate LTM to the UE and the gNB-DU for option 1 in Q3.4-1 ?**

* **Option 1: all candidate cells/UE contexts configured are maintained for subsequent LTM by default after LTM initial configuration and release of them should be done by explicit signalling.**
* **Option 2; the candidate cells that should be maintained for subsequent LTM are explicitly indicated and the others without indications are released after LTM.**

Comments on above question and options, please provide here.

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| Companies | Your company view on above question | Comments if any. |
| Google | Option 2 is slightly preferred |  |
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#### 3.6 E1 Aspects

The discussions in papers R3-231182, R3-231315, R3-231573, and R3-231746 begin with the WF which was agreed at last meeting.

**In case of CP UP separation, once CUCP receives LTM cell switch signling from (source)DU , CU CP initiates E1 bearer context modification including DL tunnel ID per DRB for target cell, and security keys corresponding to target cell (if updated) for data transmission.**

Some companies observed that RAN2 agreed that no security update support in Rel-18 with L1/L2 based mobility. Based on that, the following proposal is made:

**Proposal 3.6-1: For intra-CU-UP case, propose to turn the following WF to an agreement:**

**In case of CP UP separation, once CUCP receives LTM cell switch signling from (source)DU , CU CP initiates E1 bearer context modification to the CU UP including DL tunnel ID per DRB for target cell, for data transmission.**

Furthermore, the proposal for inter-CU-UP would look like:

**Proposal 3.6-2: For inter-CU-UP LTM, once the CU-CP receives LTM cell switch signaling from (source) DU, the CU-CP initiates E1 bearer context modification to the target CU UP including DL tunnel ID per DRB for data transmission.**

Comments on above proposals, please provide here.

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| --- | --- | --- |
| Companies | Your company view on above proposals | Comments if any. |
| Google | OK with the proposals |  |
|  |  |  |

For intra-CU-UP LTM, one paper proposed the following signaling optimization:

**Proposal 3.6-3: One option that can minimize the impact on CU-UP when performing LTM is that the steps 3 and 4 are executed together with steps 9 and 10.**

**Proposal 3.6-4: One more option that can minimize the impact on CU-UP when performing LTM is that the CU-UP provides only one UL TNL address which will only be used by the target cell after successful execution of LTM cell switch.**



Comments on above proposals, please provide here.

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| --- | --- | --- |
| Companies | Your company view on above proposals | Comments if any. |
| Google |  | Not sure if signalling optimization is needed |
|  |  |  |

Furthermore, in case of inter CU-UP LTM, before cell switch there are some unsuccessfully transmitted DL data and new DL data already buffered at source CU-UP. For avoiding data loss, some papers propose that E1 bearer context modification shall be also used for getting the PDCP status at source CU-UP and exchanging the data forwarding information for data forwarding from source CU-UP to the target CU-UP. The target CU-UP can then (re)transmit the data to UE via the target cell after UE has accessed the target cell.

Then, the following is proposed by the moderator:

**Proposal 3.6-3: For inter-CU-UP LTM, the CU-CP initiates E1 bearer context modification to the source CU-UP for retrieving the latest PDCP status at the source CU-UP and exchanging the data forwarding information to target CU-UP.**

**Proposal 3.6-4: In case of gNB-CU-UP change, the gNB-CU triggers the source gNB-CU-UP to start data forwarding after receiving LTM cells switch signalling from DU.**

Comments on above proposals, please provide here.

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| --- | --- | --- |
| Companies | Your company view on above question | Comments if any. |
| Google | OK with the proposals |  |
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In addition, thanking to the Access Success message from the target gNB-DU, the CU-CP may know that the UE has successfully accessed to the target cell, it then initiates the path switch procedure towards the CN for switching transmission of the subsequent DL data to the target CU-UP, e.g. via the new path.

Then, the following is proposed by the moderator:

**Proposal 3.6-5: For inter-CU-UP LTM, Path switch procedure is performed towards the core network after detecting the UE has accessed to the target cell.**

Comments on above proposals, please provide here.

|  |  |  |
| --- | --- | --- |
| Companies | Your company view on above question | Comments if any. |
| Google | OK with the proposal |  |
|  |  |  |

If above proposals are agreeable, the following shows the tentative overall message flow for inter-CU-UP LTM. For intra-CU-UP LTM message flow, the moderator thinks that it is simple and could be treated part of the inter-CU-UP case. The only difference is in step 2 and 3, in which Bearer Context Modification will be used in case of intra-CU-UP LTM.

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**Figure : Inter-DU LTM with gNB-CU-UP change**

0. The source gNB-DU forwards the Measurement Report to the gNB-CU-CP.

1. The gNB-CU-CP decides to initiate LTM configuration.

2. The gNB-CU-CP sends a BEARER CONTEXT SETUP REQUEST message containing UL TNL address information for NG-U to setup the bearer context in the gNB-CU-UP.

3. The gNB-CU-UP responds with a BEARER CONTEXT SETUP RESPONSE message containing the UL TNL address information for F1-U, and DL TNL address information for NG-U.

4 - 5. F1 UE context setup procedure is performed to setup one or more bearers in the gNB-DU.

6. The gNB-CU-CP notifies the source gNB-DU and sends the RRC Reconfiguration message to the UE.

7. The source gNB-DU make the LTM decision.

8. The source gNB-DU sends the LTM cell switch notify message to the gNB-CU-CP with the selected target cell ID.

9-10. The gNB-CU-CP performs the Bearer Context Modification procedure to retrieve the PDCP UL/DL status and to exchange data forwarding information for the bearer.

11-12. The gNB-CU-CP performs the Bearer Context Modification procedure to send the DL TNL address information for F1-U and data forwarding between source gNB-CU-UP and target gNB-CU-UP, and PDCP status..

13. The target gNB-DU detects the UE in the target cell.

14. The target gNB-DU sends an Access Success message to the gNB-CU-CP.

15. Data Forwarding may be performed from the source gNB-CU-UP to the target gNB-CU-UP.

16 - 18. Path Switch procedure is performed to update the DL TNL address information for the NG-U towards the core network.

19-20. Bearer Context Release procedure may be performed to release the UE context in the source gNB-DU. This step may be skipped in case that subsequent LTM is supported.

**Q3.6-1: Any comments on above tentative message flow for inter-CU-UP LTM?**

Comments on the tentative inter-CU-UP LTM message flow, please provide here.

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| --- | --- | --- |
| Companies | Your company view on above question | Comments if any. |
| Google | Generally ok  | Should it be Q3.6-6? |
|  |  |  |

# 4 Conclusion

# 5 Reference

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| --- | --- | --- |
| [R3-231182](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231182.zip) | TP (BL CR TS 38.401) L1/2 Triggered Mobility (LTM) Procedures (Nokia, Nokia Shanghai Bell) | other |
| [R3-231183](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231183.zip) | Discussion on TA Acquisition for LTM (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-231239](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231239.zip) | gNB-DU initiated target cell re-configuration for L1/L2 triggered mobility (Rakuten Symphony) | discussion |
| [R3-231315](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231315.zip) | Signalling Support for LTM (Qualcomm Incorporated) | discussion |
| [R3-231381](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231381.zip) | co-existence between LTM and L3 mobility (NEC) | discussion |
| [R3-231382](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231382.zip) | (TP to TS 38.473 on LTM) co-existence between LTM and L3 mobility (NEC) | other |
| [R3-231388](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231388.zip) | (TP for L1L2Mob BLCR for TS 38.401) Discussion on reference configuration in LTM (Google Inc.) | other |
| [R3-231447](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231447.zip) | Discussion on L1L2 based inter-cell mobility (Lenovo) | discussion |
| [R3-231448](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231448.zip) | (TP to TS 38.401 & TS 38.470) Support of L1L2 based inter-cell mobility (Lenovo) | other |
| [R3-231458](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231458.zip) | Collision between L1/L2-triggered mobility and L3 mobility (vivo) | discussion |
| [R3-231459](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231459.zip) | Discussion on L1/L2-triggered Mobility (vivo) | discussion |
| [R3-231510](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231510.zip) | Discussion on remaining issues for LTM procedure (China Telecommunication) | discussion |
| [R3-231511](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231511.zip) | (TP to TS 38.473 BL CR) On support of LTM procedure (China Telecommunication) | other |
| [R3-231573](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231573.zip) | (TP for LTM BL CR to TS 38.401) Solutions for LTM (Ericsson) | other |
| [R3-231574](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231574.zip) | (TP for LTM BL CR to TS 38.473) F1AP impacts for LTM (Ericsson) | other |
| [R3-231652](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231652.zip) | Discussion on LTM related issues (LG Electronics Inc.) | discussion |
| [R3-231653](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231653.zip) | (TP for NR\_Mob\_enh2 BL CR for TS 38.401) Discussion on LTM related issues (LG Electronics Inc.) | other |
| [R3-231654](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231654.zip) | (TP for NR\_Mob\_enh2 BL CR for TS 38.473) Discussion on LTM related issues (LG Electronics Inc.) | other |
| [R3-231678](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231678.zip) | Discussion on left issues for L1/L2 mobility (CATT) | discussion |
| [R3-231679](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231679.zip) | (TP for L1L2 Mob BLCR for TS 38.401) Support of L1L2 based inter-cell mobility (CATT) | other |
| [R3-231745](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231745.zip) | (TP for L1L2Mob BLCR for TS 38.401): L1/L2 Mobility procedure on F1 (Huawei) | other |
| [R3-231746](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231746.zip) | (TP for L1L2Mob BLCR for TS 38.401): L1/L2 Mobility procedure on E1 (Huawei) | other |
| [R3-231747](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231747.zip) | (TP to Mob\_enh2 BL CR TS38.401) Discussion on L1/L2 based Inter-cell Mobility (Samsung Electronics France SA) | discussion |
| [R3-231751](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231751.zip) | Considerations on parallel vs single (including TPs for TS 38.473) (Intel Corporation) | discussion |
| [R3-231807](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231807.zip) | Discussion on L1L2 based Inter-Cell Mobility (CMCC) | discussion |
| [R3-231808](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231808.zip) | (TP to TS 38.401) L1L2 based Inter-Cell Mobility (CMCC) | other |
| [R3-231813](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231813.zip) | Further discussion on LTM (NTT DOCOMO INC.) | discussion |
| [R3-231848](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231848.zip) | (TP for LTM BL CR to TS 38.473) Discussion on L1/L2 triggered mobility (ZTE) | other |
| [R3-231849](file:///D%3A%5C%E4%BC%9A%E8%AE%AE%E7%A1%AC%E7%9B%98%5CTSGR3_119bis-e%5CDocs%5CR3-231849.zip) | TP for LTM BL CR to TS 38.401 (ZTE) | other |