**3GPP TSG-RAN WG2 Meeting #131** **R2-2500xxx**

**Bangalore, India, Aug 25th – 29th, 2025**

Agenda Item: 8.6.2

Source: CATT

**Title:** Report of [POST130][120][MOB] (CATT)

**Document for:** Discussion and Decision

# Introduction

This document is the report of the following email discussion.

* **[POST130][120][MOB] (CATT)**

**Scope:** Update UE capability running CRs if needed (also including the latest other WGs’ inputs). And identify and discuss remaining UE capability related open issues.

**Intended outcome:** 38.306 and 38.331 running CR and discussion summary (if needed).

**Deadline:** Long email discussion.

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| --- | --- |
| **Company** | **Name (Email)** |
| Xiaomi | Yujian Zhang, zhangyujian@xiaomi.com |
| vivo | Jing LIANG, liangjing@vivo.com |
| MediaTek | Xiaonan, xiaonan.zhang@mediatek.com |
| Ericsson | Tony, antonino.orsino@ericsson.com |
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# UE capability open issues

## L1 event triggered measurement reporting

Regarding L1 event triggered measurement reporting, it is suggested to discuss the needs of UE capability for the functions introduced by RAN2.

### Issue 1: Whether to define a capability for LTM events

In legacy, there are some UE capabilities defined for the L3 measurement events as follows,

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| --- | --- | --- | --- | --- |
| ***eventA-MeasAndReport***  Indicates whether the UE supports NR measurements and events A triggered reporting as specified in TS 38.331 [9]. This field only applies to SN configured measurement when (NG)EN-DC is configured. For NR SA, MN and SN configured measurement when NR-DC is configured, and MN configured measurement when NE-DC is configured, this feature is mandatory supported. | UE | Yes | Yes | No |
| ***eventB-MeasAndReport***  Indicates whether the UE supports EUTRA measurement and event B triggered reporting as specified in TS 38.331 [9]. It is mandated if the UE supports EUTRA. | UE | CY | No | No |
| ***eventD1-MeasReportTrigger-r17***  Indicates whether the UE supports location-based triggered measurement reporting (i.e., event D1) as specified in TS 38.331 [9]. It is mandated if the UE supports *locationBasedCondHandover-r17* in any NTN band. It is mandated if the UE supports *locationBasedCondHandoverATG-r18* in any ATG band. | UE | CY | No | No |
| ***eventD2-MeasReportTrigger-r18***  Indicates whether the UE supports location-based triggered measurement reporting for an NTN Earth-moving cell (i.e., event D2) as specified in TS 38.331 [9]. It is mandated if the UE supports *locationBasedCondHandoverEMC-r18* in any NTN band. | UE | CY | No | No |

So we may need to clarify whether it is necessary to define UE capability for the support of LTM events. In rapporteur’s understanding, it seems sufficient to introduce a UE capability for the support of all the LTM events.

**Q1: Do you agree to introduce a per UE capability for the support of all the LTM events?**

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | Yes |  |
| vivo | Yes |  |
| MediaTek | Yes | One for all |
| Ericsson | Yes |  |
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### Issue 2: Whether to define a capability for the support of the new MR MAC CE

Besides the capability defined for LTM events, whether to define a separate capability for the support of the new MR MAC CE is also to clarify, considering supporting LTM events UE could only report the MR by the new MR MAC CE, the rapporteur suggest separate capability for the new MR MAC CE is not needed;

**Q2: Do you agree to NOT introduce a separate UE capability for the support of the new MR MAC CE?**

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| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | Agree | MR MAC CE is an integral part of LTM events, therefore a separate capability for MR MAC CE is not needed. |
| vivo | Agree | The motivation for separate capability for new MAC CE is not clear to us, we understand if the UE supports event-triggered L1 measurement reporting, it should also support using this new MAC CE. |
| MediaTek | Agree |  |
| Ericsson | Agree |  |
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### Issue 3: Whether to define a capability for the support of the Truncated MR MAC CE

Regarding whether separate capability is needed for truncated MR MAC CE, the rapporteur think separate capability for truncated MR MAC CE is not needed due to that in legacy separate capability for truncated MAC CE hasn’t been defined.

**Q3: Do you agree to NOT introduce a separate UE capability for the support of the Truncated MR MAC CE?**

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| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | Agree | It is fine to follow legacy. Truncated MR MAC CE is due to insufficient UL grant, and there is no need to define a separate UE capability. |
| vivo | Agree | Agree with rapporteur that we can follow the legacy mechanism that no separate capability is needed. |
| MediaTek | Agree |  |
| Ericsson | Agree |  |
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### Issue 4: Whether to define a capability for the support of event triggered periodic MR MAC CE reporting

RAN2 has agreed to support the event triggered periodic MR MAC CE reporting. It is better to also clarify whether to define a UE capability for the support of the event triggered periodic MR MAC CE reporting. The rapporteur think separate capability for this is not needed due to that in legacy separate capability for event triggered periodic measurement reporting in L3 measurement has not been defined.

**Q4: Do you agree to NOT define a separate capability for the support of event triggered periodic MR MAC CE reporting?**

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | Agree | It is fine to follow legacy. |
| vivo | Agree |  |
| MediaTek | Agree |  |
| Ericsson | Agree |  |
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### Issue 5: Whether to define a capability for the support of the reportOnLeave for LTM

RAN2 has agreed MR MAC CE can be sent when the leaving condition is met. It is better to also clarify whether to define a UE capability for the support of the reportOnLeave for LTM. The rapporteur think separate capability for this is not needed due to that in legacy separate capability for reportOnLeave in L3 measurement hasn’t been defined.

**Q5: Do you agree to NOT define a separate capability for the support of the reportOnLeave for LTM?**

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | Agree | It is fine to follow legacy. |
| vivo | Agree | Agree with rapporteur. |
| MediaTek | Agree |  |
| Ericsson | Agree |  |
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### Issue 6: Whether to define a capability for the max number of beams in the MR MAC CE

For the max number of beams in the MR MAC CE, the UE capability on this is to be clarified.

However, it has mentioned In RAN1 reply LS R1-2503077 as follows,

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| --- |
| RAN1 assumes at maximum 16 beams can be reported by a single event triggered reporting regardless whether or not the report includes the current beam. It is noted that the maximum number of beams that can be reported by a UE is subject to UE capability which is under discussion in RAN1. |

So the rapporteur thinks we can just wait RAN1 progress on this.

### Issue 7: Whether to define a capability for the current beam reporting in the MR MAC CE

RAN2 has agreed current beam can be included in the MR MAC CE. In R18, the capability currentSpCellInclL1-Report-r18 is used to indicatessupport of always including the current SpCell in the L1 measurement report. It could be used for gNB scheduling report obviously, and after RAN2#130, RAN1 feature list LS R2-2504952, it defines the feature of 63-8 “Inclusion of current SpCell in the L1 measurement report based on CSI-RS (s)” , it doesn’t specify whether it could be used for gNB scheduling or event triggered measurement report. The rapporteur suggests to reuse these two capability for event triggering measurement report.

**Q7: Do you agree to reuse the capability currentSpCellInclL1-Report-r18 and 63-8 defined by RAN1(i.e., as indicated in R2-2504952) for the current beam reporting in the MR MAC CE?**

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| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | Yes |  |
| vivo | Yes |  |
| MediaTek | Yes | currentSpCellInclL1-Report-r18 for SSB, and the new 63-8 for CSI-RS. |
| Ericsson | Yes |  |
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### Issue 8: Whether to define a capability for reporting the beam not satisfying the event condition in the MR MAC CE?

RAN2 has agreed beams not satisfying the event condition can be included in the MR MAC CE. It is necessary to clarify whether to define a UE capability for reporting the beam not satisfying the event condition in the MR MAC CE.

**Q8: Do you agree to define a per UE capability for the any beam reporting in the MR MAC CE?**

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | Yes |  |
| vivo | Yes | For the beam not satisfying the event condition, it is seen as type-4 beam. If we define a separate capability for type-4 beam reporting, then another question is whether we need to consider type 1/2/3 as separate capability as well, but in general, we think it is ok to just have a separate capability for type-4 beam considering type-4 beam is not really ‘necessary’ in some sense. NW can rely on this capability to configure if the beam(s) not satisfying the event could be reported. |
| MediaTek | Yes | Reporting “irrelevant beams” is an optimization and should be optional for UE.  Also, this may determine whether network can indicate “*allowReportAnyBeam*”.   * Option1: Define a capability; network can only indicate “*allowReportAnyBeam*” to capable UE. If this is indicated to UE, UE can send Type4 beams. * Option2: No capability defined; network can indicate “*allowReportAnyBeam*” to any UE. If UE does not support it, UE does not send Type4 beams. If UE support it, UE can send Type4 beams.   Option1 seems to be more common in 3GPP. |
| Ericsson | No | Even if network indicate to the UE that can report beam not satisfying the event condition, whether to include them or not is still up to the UE implementation and up to the remaining space in the MAC CE. Because of this, even if network configure the UE, the **UE is not mandated** to report such beams. This is different from the SpCell inclusion capability, where the UE is expected to report such beams. Therefore, this capability seems totally unnecessary. |
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## Conditional LTM

### Issue 9: Whether the support of R18 RACH-less LTM and R19 CLTM mandates the support of at least one of cltm-EarlyTA-Indication-r19 and ue-TA-Measurement-r18

In RAN2#129bis meeting, it was agreed that,

* When a UE indicates support for both conditional LTM and ltm-RACH-LessCG-r18, it implies that the UE supports RACH-less conditional LTM with a configured grant. Whether/how to update the field description of ltm-RACH-LessCG-r18 can be addressed in the running CR review.

The agreement above are captured in the 306 running CR as follows,

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| --- | --- | --- | --- | --- |
| ***ltm-RACH-LessCG-r18***  Indicates whether the UE supports RACH-less LTM with configured grant for MCG LTM if the UE indicates support of *ltm-MCG-IntraFreq-r18* or for SCG LTM if the UE indicates support of *ltm-SCG-IntraFreq-r18* respectively.  UE indicating support for this feature shall also indicate support of either *ltm-BeamIndicationJointTCI-r18* or *ltm-BeamIndicationSeparateTCI-r18* for at least one band and either *ta-IndicationCellSwitch-r18* or *ue-TA-Measurement-r18*.  If the UE indicates support of *cltm-ExecutionConditionL3-r19* or *cltm-ExecutionConditionL1-r19*, indicates whether the UE supports RACH-less conditional LTM with configured grant for MCG LTM.  The UE indicating support of this feature and of at least one of *cltm-ExecutionConditionL3-r19* and *cltm-ExecutionConditionL1-r19* shall indicate support of at least one of *cltm-EarlyTA-Indication-r19* or *ue-TA-Measurement-r18*. | UE | No | No | No |

According to the agreement and the running CR, the support of R18 RACH-less LTM and R19 CLTM mandate the support of at least one of cltm-EarlyTA-Indication-r19 and ue-TA-Measurement-r18.However,It is questioned by some company whether such restriction is reasonable.

Details can be found in R2-2503470 as follows,

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| --- | --- | --- | --- | --- | --- | --- |
| **Observation 8: For a UE support R18 RACH-less LTM, R19 basic CLTM, but not support R19 RACH-less CLTM cannot find a proper way to indicates its capability.**  Therefore, we suggest to simply revise the previous agreement and field description in the running CR to solve this issue:   |  | | --- | | When a UE indicates support for both conditional LTM and ltm-RACH-LessCG-r18**, and at last one of cltm-EarlyTA-Indication-r19 and ue-TA-Measurement-r18,** it implies that the UE supports RACH-less conditional LTM with a configured grant. |   The field description of the latest UE capability running CR can be simply updated as follow to solve the issue:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | ***ltm-RACH-LessCG-r18***  Indicates whether the UE supports RACH-less LTM with configured grant for MCG LTM if the UE indicates support of *ltm-MCG-IntraFreq-r18* or for SCG LTM if the UE indicates support of *ltm-SCG-IntraFreq-r18* respectively.  UE indicating support for this feature shall also indicate support of either *ltm-BeamIndicationJointTCI-r18* or *ltm-BeamIndicationSeparateTCI-r18* for at least one band and either *ta-IndicationCellSwitch-r18* or *ue-TA-Measurement-r18*.  If the UE indicates support of *cltm-ExecutionConditionL3-r19* or *cltm-ExecutionConditionL1-r19*, and at least one of cltm-EarlyTA-Indication-r19 and ue-TA-Measurement-r18, this feature also indicates whether the UE supports RACH-less conditional LTM with configured grant for MCG LTM. | UE | No | No | No |   **Proposal 11: Add the condition “at last support one of cltm-EarlyTA-Indication-r19 or ue-TA-Measurement-r18” to determine whether UE support RACH-less conditional LTM. The TP to the UE capability running CR is adopted.** |

Therefore, companies are invited to share view on this issue.

**Q9: Do you agree to revise the agreement to “When a UE indicates support for both conditional LTM and ltm-RACH-LessCG-r18, and at last one of cltm-EarlyTA-Indication-r19 and ue-TA-Measurement-r18, it implies that the UE supports RACH-less conditional LTM with a configured grant.”?**

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | Yes | A UE doesn’t support RACH-less for Rel-19 CLTM may means the UE doesn’t support cltm-EarlyTA-Indication-r19 and ue-TA-Measurement-r18.  Hence, only the following case may have issue based on the previous agreement and CR:  For a UE support R18 RACH-less LTM with ta-IndicationCellSwitch-r18, R19 basic CLTM, but not support cltm-EarlyTA-Indication-r19 and ue-TA-Measurement-r18, cannot find a proper way to indicates its capability.  The revised agreement and running CR can solve the issue.  Editorial suggestion: “at last” 🡪 “at least”. |
| vivo | Yes | We share the same understanding that it may happen that a UE may support R18 RACH-less LTM, R19 basic CLTM, but not support R19 RACH-less CLTM. Therefore, the revised text seems fine to us, so the it can solve the mentioned issue. |
| MediaTek | Yes (as proposer) | As mentioned in the paper, R19 CLTM introduce new features like early TA(s) acquisition and maintenance. UE should be able to report this difference (Only support R18 early TA, not R19 early TA). |
| Ericsson | Yes but | We have agreed that the network can send a LTM cell switch MAC CE even in case of a conditional LTM candidate configuration, in this case indicating *at last one of cltm-EarlyTA-Indication-r19 and ue-TA-Measurement-r18*. What about the capability *ta-IndicationCellSwitch-r18*? UE may also indicate such capability. Maybe some clarification is needed. |
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### Issue 10: For the new UE capability “cltm-ExecutionConditionL3-r19”and “cltm-ExecutionConditionL1-r19”, whether UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands, all TDD-FR2-1 bands and all TDD-FR2-2 bands respectively.

In the current 306 running CR, for the new UE capability “cltm-ExecutionConditionL3-r19” and “cltm-ExecutionConditionL1-r19”, it is still FFS whether “UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands, all TDD-FR2-1 bands and all TDD-FR2-2 bands respectively.

| ***cltm-ExecutionConditionL1-r19***  Indicates that the UE supports conditional LTM with L1 execution condition. The UE that indicates support of this capabilityshall also indicate support of *ltm-MCG-IntraFreq-r18* on the same band.  Editor’s Note: whether “Except for NTN bands, UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands, all TDD-FR2-1 bands and all TDD-FR2-2 bands respectively. For NTN, UE shall set the capability value consistently for all FDD-FR1 NTN bands and all FDD-FR2 NTN bands respectively” is FFS. | Band | No | N/A | N/A |
| --- | --- | --- | --- | --- |
| ***cltm-ExecutionConditionL3-r19***  Indicates the UE supports conditional LTM with L3 execution condition, by indicating the maximimum number of trigger events for the same execution condition. The UE that indicates support of this capability shall indicate support of *ltm-MCG-IntraFreq-r18* on the same band.  Editor’s Note: whether “Except for NTN bands, UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands, all TDD-FR2-1 bands and all TDD-FR2-2 bands respectively. For NTN, UE shall set the capability value consistently for all FDD-FR1 NTN bands and all FDD-FR2 NTN bands respectively” is FFS. | Band | No | N/A | N/A |

In rapporteur’s understanding, such restriction seems reasonable as there is similar restriction for CHO capability (i.e., condHandover-r16).

**Q10: Do you agree that, for the new UE capability “cltm-ExecutionConditionL3-r19”and ”** **cltm-ExecutionConditionL1-r19”, Except for NTN bands, UE shall set the capability value consistently for all FDD-FR1 bands, all TDD-FR1 bands, all TDD-FR2-1 bands and all TDD-FR2-2 bands respectively. For NTN, UE shall set the capability value consistently for all FDD-FR1 NTN bands and all FDD-FR2 NTN bands respectively?**

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | Yes |  |
| vivo | Yes |  |
| MediaTek | Yes | (But should we FFS NTN case?) |
| Ericsson | Yes |  |
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### Issue 11: Whether to define a capability for CLTM fast recovery

In R18 LTM, ltm-Recovery-r18 is defined to indicate whether the UE supports recovery procedure for MCG LTM execution when the selected cell in RRC re-establishment procedure is a LTM candidate as specified in TS 38.331 [9]. In R19, CLTM fast recovery is also supported, so whether separate capability is needed for CLTM recovery should be discussed. In rapporteur’s understanding, a new per UE capability seems necessary as the UE behavior on CLTM recovery is different from R18 LTM recovery.

In the current 306 running CR, there is a FFS on this issue.

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| ***ltm-Recovery-r18***  Indicates whether the UE supports recovery procedure for MCG LTM execution when the selected cell in RRC re-establishment procedure is a LTM candidate as specified in TS 38.331 [9].  UE indicating support for this feature shall also indicate support of *ltm-MCG-IntraFreq-r18* for at least one band.  Editor’s Note: FFS whether to reuse this capability for CLTM fast recovery and inter-CU LTM. | UE | No | No | No |

**Q11: Do you agree to define a per UE capability for CLTM fast recovery?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | See comments | In previous meeting, RAN2 has reached the following agreement:  • Support the CLTM fast failure recovery, which reuses R18 LTM failure recovery mechanism (i.e. based on CBRA).  According to the agreement, the UE behavior to apply CLTM candidate configuration for CLTM recovery seems to be the same as R18 LTM recovery.  Hence, Q11 is up to whether to support RACH-less CLTM fast recovery, or whether to support CLTM fast recovery based on CFRA. These are different from Rel-18 LTM recovery. If yes, we need to define a per UE capability(ies) for CLTM fast recovery. |
| vivo | No | In our understanding, according to previous agreements, the R19 CLTM fast recovery basically follow the same procedure as R18 (No RACH-less, no CFRA), and we understand the CLTM candidate cells will also be LTM candidate cell, so it seems same UE behaviour is expected and the *ltm-Recovery-r18* can be reused to indicated CLTM fast recovery. |
| MediaTek | Yes | Q11 seems only cover CBRA case (R18-like). We prefer to have a separate capability for CLTM.  If not, UE which indicates support for Rel-19 CLTM + ltm-Recovery-r18 is required to have also Rel-19 CLTM fast recovery procedure implemented and tested. However, there might not be enough verification possibilities for Rel-19 fast recovery, which can in practice prevent Rel-19 UEs from indicating support for ltm-Recovery-r18. |
| Ericsson | Yes | LTM fast recovery only supports CBRA and with the agreement we took we stick to the same principle also for CLTM. The capability can be re-used and we don’t need now to support additional scenarios with respect to what we have already agreed. |
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## Inter-CU LTM

### Issue 12: Whether to define a capability for inter-CU LTM recovery

In R18 LTM, ltm-Recovery-r18 is defined to indicate whether the UE supports recovery procedure for MCG LTM execution when the selected cell in RRC re-establishment procedure is a LTM candidate as specified in TS 38.331 [9]. In R19, inter-CU LTM fast recovery is supported with restriction to with the same candidate ID of target cell, so whether separate capability is needed for inter-CU LTM recovery should be discussed. In rapporteur’s understanding, a new per UE capability seems necessary as the UE behavior on inter-CU LTM recovery is different from R18 LTM recovery.

**Q12: Do you agree to define a per UE capability for inter-CU LTM fast recovery?**

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| --- | --- | --- |
| **Company** | **Yes or No** | **Comments if any** |
| Xiaomi | Yes |  |
| vivo | Yes |  |
| MediaTek | Yes | Inter-CU recovery requires more UE behaviors. E.g., master key generation, RLC,PDCP re-establishment. |
| Ericsson | No | The fast recovery procedure is pretty much up to what UE support and for us the existing capability can be re-used. In such a case, if UE reports the Rel-18 capability and network configured it, then it would be up to the UE to execute the Rel-18 procedure or the Rel-19. We don’t really see the point of having a new capability. |
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## Other UE capability open issues

This section is to collect other UE capability open issues identified by companies.

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| **Company** | **Yes or No** | **Comments if any** |
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# Open issue list

The open issue list will be updated later based on discussion in section 2.

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| **Issue index** | **Issue description** | **Rapporteur suggestion** |
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# Conclusion

# Reference

1. R2-2503470 Further discussion on conditional LTM MediaTek