3GPP TSG-RAN WG3 Meeting #107bis-e R3-202639

E-meeting, 20 – 30 April, 2020

**Agenda item: 10.3.1**

**Source: Ericsson (moderator)**

**Title: Summary of discussions on MDT for Inactive UEs**

**Document for: Approval**

# 1 Introduction

This paper provides summary of discussions at RAN#107bis-e on MDT for Inactive UEs:

**CB: # 1009\_Email\_SON-MDT\_MDT\_Inactive**

**- Take into account related points raised in 1790 (e.g. “open issue #1”) and 1783, 1784 (submitted to 10.3.1)**

**- Collect companies’ views on the issue of Logged MDT availability flag in the RETRIEVE UE CONTEXT RESPONSE message, proceed only if there is consensus or at least clear majority view**

(E/// - moderator)

Summary of offline discussion [R3-202470](file:///E:\3GPP%20meeting\RAN3\107bis\inbox\CB%20%23%201009_Email_SON-MDT_MDT_Inactive\Inbox\R3-202470.zip)

It is proposed to allocate related TPs to companies as follows:

* TBD

# 2 For the Chairman’s Notes

[To be completed]

# 3 Discussion

## 3.1 How to enforce RAN2’s agreement “*Management based MDT should not overwrite signaling based MDT*”

RAN2 agreed that “*Management based MDT should not overwrite signaling based MDT*”. Companies should provide their view on how to ensure that this agreement is fulfilled for UEs in RRC Inactive that re-connect in a new NG-RAN node.

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| Company | Comment |
| ZTE | RAN2 ‘s agreement is not only cover UEs in RRC inactive state but in other RRC state.  Take signalling logged MDT for example, after UE receive signalling based logged MDT configuration via RRC message, the UE enters RRC\_IDLE state and starts MDT measurement. When the UE accesses to another gNB, how does the new gNB know whether the UE has a valid signalling based MDT configuration?  If the issue is identified, then the candidate approaches including Assistant from Core network, Indication in Xn (as Moderator suggested ), Indication via RRC, etc. The approach provided in R3-202262 seems only apply MDT for UE in RRC\_INACTIVE state.  It seems some typos in the tile: the AI seems to be 10.3.2; the title Tdoc number R3-202470. |
| Samsung | When the inactive mode UE is resumed in a new gNB, the new gNB knows whether there is a signalling based logged MDT configuration from the UE CONTEXT RETRIVE RESPONSE message. And if the logged MDT configuration is already sent to the UE, a logMeasAvailable Indicator is included in RRC RESUME COMPLETE message, so the new gNB knows if the UE is configured logged MDT or not. If the UE is not configured, the new gNB sends a configuration message before UE is moves into idle/inactive mode.  So the new gNB can ensure “*Management based MDT should not overwrite signaling based MDT*”. |
| Huawei | Agree to Samsung’s comments above. The only case is that there is no logged MDT configuration at the source node, in this case, there is no logged MDT config propagation either. The drawback could be that UE will not be selected by the target node for management based MDT. However, this does not violate RAN2 agreement.  At RAN2-109-e meeting, the following agreements were made:  Agreements:  1 Only immediate MDT is supported for EN-DC scenario in R16 MDT  2 In signaling based immediate MDT, MME provides MDT configuration for both MN and SN towards MN including multi RAT SN configuration, specifically E-UTRA and NR MDT configuration. MN then forwards the NR MDT configuration towards SN (EN-DC scenario, SN is always NR).  3 In management-based immediate MDT, OAM provides the MDT configuration to both MN and SN independently. Inform other working group that Management based MDT should not overwrite signaling based MDT.  4 For immediate MDT configuration, MN and SN can independently configure and receive measurement from the UE.  5 UE follow the release 15 RRM behavior to report the triggered measurements for Immediate MDT.  It is apparent that the RAN2 agreement “Inform other working group that Management based MDT should not overwrite signaling based MDT.” Was made under the context of MDT in EN-DC.  Therefore, we would like to propose to send a LS to RAN2 to clarity whether that agreement is also applicable for MR-DC case which impact Xn considering that MDT in EN-DC is not supported in rel-16.  Furthermore, it is noticed that RAN2 also discusses this issue at this week. It seems not only UE mobility in inactive state, but also in idle state should be considered. The idle mode use case could be that the UE received a signaling based logged MDT in cell 1 and went to idle, then reselect to cell 2 and transfer to RRC\_ACTIVE which the logged duration is not expired.  Transferring only a single bit in UE context retrieve may not solve the issue for idle mode UEs.  So, we propose to send a LS to RAN2 to clarity above two issues. |
| CMCC | Same comment as Samsung.  In addition, how to ensure “*Management based MDT should not overwrite signaling based MDT*” is a general question for all RRC states, especially for RRC idle and inactive, not specific for RRC\_inactive.  As mentioned by Huawei, RAN2 is also discussing how to ensure this agreement for RRC\_inactive and idle UEs, if for example a solution that to include a signalling-based or management-based MDT indication in Loggedmeasurementconfig message at Uu interface was agreed by RAN2, it can ensure the RAN2 agreement for both inactive and idle.  Having a single flag cannot solve the whole issue. |
| Ericsson | Firstly, it needs to be clarified that this summary of offline discussinos is for Inactive UEs and purposely it is leaving out any other RRC state. We are fine with broadening the use case and introduce more RRC states in the analysis. However, for the sake of moving on for this AI, we should consider the case of Inactive only.  It is our understanding that the discussion in RAN2 on the agreement “*Management based MDT should not overwrite signaling based MDT*” started from the EN-DC scenario, but the agreement taken from RAN2 is generic and applicable to all cases. We welcome an LS to clarify this aspect with RAN2.  Regarding the explanations from Samsung:  *[Samsung] When the inactive mode UE is resumed in a new gNB, the new gNB knows whether there is a signalling based logged MDT configuration from the UE CONTEXT RETRIVE RESPONSE message. And if the logged MDT configuration is already sent to the UE, a logMeasAvailable Indicator is included in RRC RESUME COMPLETE message, so the new gNB knows if the UE is configured logged MDT or not.*  A *logMeasAvailable Indication* may not be signalled to the new serving node. For example, if the logging period has not expired and the log is not available, the indication is not signalled; if the UE resumes in an area that is not allowed for the logging, the indication is not signalled by the UE. Therefore, determining whether the UE has been configured with signalling based logged MDT only by reception of the *logMeasAvailable Indication* is subject to errors.  Therefore, to solve the issue of how to enforce the agreement “*Management based MDT should not overwrite signaling based MDT*” for Inactive UEs the method of signalling a logged MDT configuration only it it is pending is not sufficient as it cannot avoid that a management based MDT configuration overwrites a signalling based configuration. Extra information needs to be provided to the RAN in order to let the resume RAN node to understand the following \*in all cases\*, i.e. also in the cases when the *logMeasAvailable Indic* is not signalled by the UE:   * Whether the signalling based logged MDT configuration is active at the UE * Whether the signalling based logged MDT configuration is pending at the UE |

## 3.2 “Signaling Based Logged MDT State” flag in the RETRIEVE UE CONTEXT RESPONSE message on XnAP

In R3-202261, R3-201790 and R3-201784 a solution to ensure the agreement for RAN2 on “*Management based MDT should not overwrite signaling based MDT*” has been proposed. The solution is based on signalling of Logged MDT configurations as pert of the UE Context Retrieval procedures over the Xn interface, together with an indication of whether the configuration has been activated at the UE or whether it is pending to be activated. Companies should provide their view on this solution.

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| Company | Comment |
| ZTE | As explained in section 3.1 |
| Ericsson | The solution described in R3-202261 (Ericsson) and R3-201790 (Qualcomm) provides means to resolve the issue identified in section 3.1, i.e. it provides a solution that lets the resume RAN node to understand, \*in all cases\*, i.e. also in the cases when the *logMeasAvailable Indic* is not signalled by the UE, the following:   * Whether the signalling based logged MDT configuration is active at the UE * Whether the signalling based logged MDT configuration is pending at the UE   This solution is an extremely simple solution consisting of only adding one flag IE in the RETRIEVE UE CONTEXT RESPONSE message. Considering the low specification and implementation impact of this solution, we suggest to at least agree in principle to adding information in the RETRIEVE UE CONTEXT RESPONSE message that allow the target RAN to understand the status of a signalling based logged MDT configuration. |
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### 3.1.2 Interim Summary of Offline Discussions

Below are the points on which discussions focussed

*Issue 1*

The first point raised by a number of companies concerns the following RAN2 agreement:

“*Management based MDT should not overwrite signalling based MDT*”

This agreement was taken by RAN2 in the context of EN-DC. However, it is the understanding of a number of companies that the agreement applies in general to all cases.

**Conclusion 1: RAN3 should LS RAN2 asking whether the agreement “*Management based MDT should not overwrite signalling based MDT*” is applicable to all MDT scenarios**

Companies are welcome to state their opinion on the above conclusion

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| --- | --- | --- |
| Company | Support | Comment |
| Ericsson | Yes | It is useful to clarify in which cases the agreement from RAN2 applies |
| CMCC | Yes | We think it is used for all cases. It is beneficial to clarify this with RAN2 |

*Issue 2*

Under the assumption that the agreement applies to all MDT scenarios the following is discussed.

Some companies highlighted that one way to understand the MDT configuration status of a UE is based on reception at the new serving RAN node of the *logMeasAvailable* IE.

However, it was pointed out that, according to TS 38.331, the *logMeasAvailable* Indicator shall not be signalled by the UE in all cases when the UE has an active Signalling Based Logged MDT configuration. In cases where a measurement log is not available (Note1) or in cases when the UE is outside the MDT area scope, the logMeasAvailable Indicator will not be signalled by the UE.

Therefore, it is not possible to understand in all cases whether a UE is configured with an MDT signalling based configuration and for that it is not be possible to enforce the agreement from RAN2 that

“*Management based MDT should not overwrite signalling based MDT*”

*Note1: It was clarified that a UE reports the logged measurement indicator even if the timer T330 has not expired but only if the UE has logged measurements available. There will be scenarios when the timer is running but the UE still does not have any report available. Consider the scenario when the UE receives the logged MDT configuration and where the node releases the UE. The UE may camp in a different carrier which is not in the area scope for the logged measurements. In such carrier the UE does not log anything. So there is no log available and when the UE moves to RRC\_Connected in a neighbouring cell the UE will not signal the logged measurement indicator.*

**Conclusion 2: a solution to enable the RAN to respect the agreement from RAN2 above is needed**

Companies are welcome to state their opinion on the above conclusion:

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| --- | --- | --- |
| Company | Support | Comment |
| Ericsson | Yes | It is important to have a solution for this case. Not having a solution implies that errors will occur when signaling based MDT configurations are over-written by management based configurations. If not addressed now, such issues will have to be addressed later on with a much bigger impact on legacy deployments. |
| CMCC |  | We agree not in all the case UE will provide logMeasAvailable Indicator to NW and a solution is needed. But it does not mean a RAN3 solution with network signaling is necessarily needed to respect the agreement. We could monitor RAN2 progress on this. |

*Issue 3*

Some companies have also raised questions on the scenario scope and whether we should limit our views to RRC\_Inactive states or also to RRC\_Idle states. Namely, should solutions that enable enforcement of the agreement from RAN2 also cover the case of Idle UEs connecting to a new NG RAN node?

**Conclusion 3: RAN3 to decide if the discussion should be broadened to cover also Idle UEs**

Companies are welcome to state their opinion on the above conclusion:

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| --- | --- |
| Company | Comment |
| Ericsson | RAN3 should extend its discussion scope to cover Idle mode UEs. |
| CMCC | Yes, a common solution for idle and inactive UEs are preferred. |

# 4 Conclusion, Recommendations [if needed]

It is proposed to agree on the following:

**Conclusion 1: RAN3 should LS RAN2 asking whether the agreement “*Management based MDT should not overwrite signalling based MDT*” is applicable to all MDT scenarios**

A draft LS is available in R3-20xxxx.

**Conclusion 2: a solution to enable the RAN to respect the agreement from RAN2 below is needed:**

**“*Management based MDT should not overwrite signalling based MDT*”**

**Conclusion 3: RAN3 should extend its discussion scope to cover Idle mode UEs.**

**Conclusion 3: Network based solutions allowing enforcement of the RAN2 agreement in Idle mode are available (e.g. signalling of MDT Status flag from CN to RAN). RAN3 to decide if the discussion should be broadened to cover also Idle UEs.**

# 5 References

[1] R3-20xxxx, Title, Company