3GPP TSG-RAN WG2 Meeting #119 R2-22xxxxx

Online, 17 – 26 August 2022

**Agenda item: 8.13.4**

**Source: Nokia, Nokia Shanghai Bell**

**Title: Summary on 8.13.4**

**WID/SID:** **NR\_ENDC\_SON\_MDT\_enh2-Core - Release 18**

**Document for: Discussion and Decision**

# 1 Introduction

This document is to summarize proposals submitted to RAN2#119-e on Rel-18 WI on SON/MDT enhancements, for the following WI objective:

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| - Support of signaling based logged MDT override protection to address the scenario where the signaling based MDT is configured in E-UTRAN when [RAN2, RAN3]:* UE reselects to NR while logged measurements are collected
* UE reselects to NR after logged measurements are collected and before uploading the logged MDT report.
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It collects and summarizes proposals made in the companies’ contributions in [1]-[8], proposing to conclude which of the issues can be categorized as essential to be scoped for Rel-18 enhancements.

# 2 Discussion

## 2.1 Scenarios to be addressed in Rel-18

Rel-17 introduce Signaling based logged MDT protection as follows:

* the network configures the UE with *LoggedMeasurementConfiguration* and provides an indicator in the logged MDT configuration to the UE, to indicate whether the logged measurement configuration is Signalling based MDT
* The UE stores the indication on the logged MDT configuration when the logged measurement configuration is Signalling based MDT
* The stored parameter is used by the UE to indicate the Signaling MDT configuration availability in RRCSetupComplete and RRCResumeComplete.

For inter-RAT scenario, the WID targets:

- Support of signalling-based logged MDT override protection to **address the scenario** **where the signalling-based MDT is configured in E-UTRAN** when [RAN2, RAN3]:

* UE reselects to NR while logged measurements are collected
* UE reselects to NR after logged measurements are collected and before uploading the logged MDT report.

Hence, the agreed WID scenario forRel-18 inter-RAT support for signalling based logged MDT override protection is:

* **MDT is configured in E-UTRAN**, the UE **reselects** to NR

It can be noted from contributions in [1], [4], [5], [7] that proposals made to RAN2#119-e attempt to clarify whether the scope of Rel-18 enhancements in context of inter-RAT scenario shouldn’t be extended. The following proposals are made in that regard:

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| CATT [1] | Proposal 1: RAN2 to discuss the following two options to address the inter-RAT scenario in R18 WID for signaling based logged MDT override protection.* Option 1: UE provides the available indicator to NR network to avoid NR override configuration
* Option 2: UE provides the available indicator to NR network and NR can request the E-UTRAN results which is not retrieved
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| Qualcomm [4] | Proposal 1: It should be clarified whether to support signaling-based logged MDT override protection in the reverse scenario to what is mentioned in the WID i.e., to address the scenario where the signaling-based MDT is configured in NG-RAN when UE reselects to LTE after logged measurements are collected and before uploading the NR logged MDT report. |
| Ericsson [5] | 1. RAN2 is kindly requested to agree on inter-RAT signalling based logged MDT protection in following scenarios
	* 1. A UE with NR signalling based MDT measurement configuration/result connects to E-UTRAN.
		2. A UE with LTE signalling based MDT measurement configuration/result connects to NR.
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| Samsung [7] | Proposal 4: RAN2 to discuss whether below scenarios need to be addressed in R18a. NR overriding signaling based MDT configured by E-UTRAb. Overriding issue during handover. |

The discussed scenario in [4] and [5] forRel-18 inter-RAT support for signalling based logged MDT override protection is:

* **MDT is configured in NR,** the UE reselects to E-UTRAN.

Which is a reverse scenario to the agreed WI objective. While the reverse scenario is one possible extension, [7] proposes to clarify that handover is also explicitly addressed (next to reselection).

Therefore, RAN2 needs to confirm at first the target scenarios for Rel-18 enhancements.

**Proposal 1:** RAN2confirms the valid scenario for Rel-18 inter-RAT scenario for signalling based logged MDT override protection is set by the WID:

* + - * 1. Logged MDT is configured in E-UTRAN, the UE reselects to NR.

**Proposal 2:** RAN2 discuss whether the following is considered in Rel-18:

* 1. **the reverse scenario** when Logged MDT is configured in NR and the UE reselects to E-UTRAN cell while logged measurements are collected in NR
	2. **the handover** scenario (E-UTRA-> NR or NR->E-UTRA HO).

## 2.2 Solution direction

### 2.2.1 Solution baseline

Majority of the contributions assume that existing Rel-17 solution, that enables NR UE, based on NR RRC signalling enhancements in TS38.331 to assist the NW in avoiding unnecessary overriding. The Rel-17 indications (in configuration from the NW, and in uplink messages from the UE) consist of a baseline for the Rel-18 enhancements. However, since currently the UE is required to apply one logged MDT configuration (one Logged MDT context, which is RAT-specific), it is seen that the intra-NR logged MDT override mechanism needs further enhancements. In that context different approaches can be undertaken:

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| --- | --- |
| CATT [1] | Proposal 1: RAN2 to discuss the following two options to address the inter-RAT scenario in R18 WID for signaling based logged MDT override protection.Option 1: UE provides the available indicator to NR network to avoid NR override configurationOption 2: UE provides the available indicator to NR network and NR can request the E-UTRAN results which is not retrieved |
| Huawei [3] | Proposal 1: For inter-RAT logged MDT override protection, Rel-17 intra-NR logged MDT override mechanism is considered as a baseline. |
| ZTE [8] | Proposal 1: LTE logged MDT configuration needs to be enhanced to include MDT type indication to indicate whether the received configuration is signalling based logged MDT or not. |

Though, different options are proposed, the rapporteur understanding is that they are all build on the Rel-17 baseline. Therefore, the following is proposed:

**Proposal 3:** Rel-17 mechanism for signalling based logged MDT override protection in intra-NR scenario is the baseline for Rel-18 inter-RAT scenario.

### 2.2.2 UE-based vs. UE-assisted solution

In [2] and [6], companies suggest that the generic assumption for Rel-18 enhancements could consider UE-centric or UE-assisted solutions to handle inter-RAT scenario for signaling based MDT override protection:

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| Xiaomi [1] | Proposal 1: The following options can be considered for the signaling based logged MDT override protection for E-UTRAN while the option2 is preference.Option 1: UE-based solution, which is UE rejects network configuration.Option 2: UE-assisted and network-based solution, which relying on network implementation through UE providing assistance. |
| Nokia [4] | Proposal 1: NW-based solution (including inter-node signalling) is prioritized for Rel-18 enhancement supporting Signaling based logged MDT override protection in inter-RAT scenarios. |

While the Rel-17 framework introduce UE support to handle NR MDT Logged MDT context storage indication, it is noted that targeting reuse of the Rel-17 principles for inter-RAT scenario, could reuse the UE NR indications and let NW to handle the RAT-specific configurations to provide further enhancements to mechanism handling the potential overriding:

**Proposal 4:** RAN2to discuss the solution approach for Rel-18 inter-RAT scenario for signalling based logged MDT override protection, i.e., whether the ‘UE-based’ or ‘UE-assisted and NW-based’ solution is considered in Rel-18.

## 2.3 LTE and NR RRC enhancements

Majority of the proposals [1], [2], [7], [8] are based on the assumption that UE-based solution is unavoidable to support Rel-18 inter-RAT scenario. Given the Rel-17 limitation, where the UE and gNB support a single RAT specific Logged MDT context through RRC procedures (36.331 and 38.331), several proposals foresee required enhancements to LTE and NR RRC signaling:

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| CATT [1] | Proposal 1: RAN2 to discuss the following two options to address the inter-RAT scenario in R18 WID for signaling based logged MDT override protection.Option 1: UE provides the available indicator to NR network to avoid NR override configurationOption 2: UE provides the available indicator to NR network and NR can request the E-UTRAN results which is not retrieved |
| Xiaomi [2] | Proposal 2: To support the signaling based logged MDT override protection for E-UTRAN when UE reselects to NR, UE can indicate assistance information to gNB as follows:* Whether the signaling based logged MDT is configured in the E-UTRAN
* T330 timer status for the E-UTRAN
* Report availability for the E-UTRAN
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| Samsung [7] | Proposal 1: Extend LTE LoggedMeasurementConfiguration with Logged MDT type indication.Proposal 2: UE informs gNB whether signaling based MDT is configured when it is configured by E-UTRA. |
| ZTE [8] | Proposal 1: LTE logged MDT configuration needs to be enhanced to include MDT type indication to indicate whether the received configuration is signalling based logged MDT or not.Proposal 2: Update UE procedure description to allow UE to report to NR base station the availability bit (i.e., *sigLogMeasConfigAvailable*) when UE has an EUTRA signalling based MDT configuration or results available.  |

The proposals made on the assumption that UE assistance solution is unavoidable, which leads to the following proposals:

**Proposal 5:** RAN2to discuss whether LTE logged MDT configuration needs to be enhanced to include MDT type indication to indicate whether the received configuration is signaling based logged MDT or not.

**Proposal 6:** RAN2to discuss whether the UE reported NR bit on signaling based logged MDT presence (i.e., *sigLogMeasConfigAvailable*) needs to be enhanced when the UE has an EUTRA signaling based MDT configuration or results available.

## 2.4 Detailed solutions scope for later

The foreseen updates to the RRC signaling and procedures could require further insight or potential specifications changes on measurements reporting, T330 timer status check, or indicator handling during Handover, as noted in [2], [4].

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| Xiaomi [2] | Proposal 2: To support the signaling based logged MDT override protection for E-UTRAN when UE reselects to NR, UE can indicate assistance information to gNB as follows:* Whether the signaling based logged MDT is configured in the E-UTRAN
* T330 timer status for the E-UTRAN
* Report availability for the E-UTRAN
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| Qualcomm[4] | Observation 2: In Rel-17, a UE indicates the availability of logged MDT results to the gNB (or eNB/ng-eNB) upon reconnection/resume/reconfiguration/setup only if it is for the logged MDT configuration of the same RAT.Proposal 2: RAN2 should discuss if override protection for signaling-based MDT is applicable for logged MDT report only or configuration as well.  |

The rapporteur considers the above proposals address more detailed aspects for handling the inter-RAT scenario in Rel-18, which depend on the initial conclusions of the framework (addressed in sections 2.1-2.3), hence the proposal is to postpone the proposals until the solution direction is concluded.

**Proposal 7:** Detailed reporting (RAT-specific reports handling, flag indication) are handled once solution baseline and generic approach for LTE/NR signalling enhancements are concluded.

# 3 Conclusion

TBA

# References

1. R2-2207479; Consideration on Inter-RAT Signaling Based Logged MDT Override Protection; CATT
2. R2-2207480; Considerations on the signaling based logged MDT override protection for E-UTRAN; Beijing Xiaomi Software Tech
3. R2-2207957; Discussion on the inter-system signalling based MDT override protection; Huawei, HiSilicon
4. R2-2208161; Signalling based logged MDT override protection; Qualcomm Incorporated
5. R2-2208179; inter-RAT signalling based logged MDT protection; Ericsson
6. R2-2208247; Signalling based logged MDT override protection in Rel-18; Nokia, Nokia Shanghai Bell
7. R2-2208536; Inter-RAT signaling based logged MDT override protection; Samsung R&D Institute India
8. R2-2208545; Consideration on Signalling based MDT protection; ZTE Corporation, Sanechips