3GPP TSG-RAN WG3 Meeting #124 R3-243778

Fukuoka, Japan, 20 – 24 May, 2024

**Agenda item: 8.3**

**Source: Nokia - moderator**

**Title: Summary of Offline Discussions on Improved KPIs**

**Document for: Approval**

# 1 Introduction

**CB: # 7\_ImprovedKPIs**

**- Check the S-TMSI issue and the feasibility**

**- Provide LS on misalignments between TS 28.552 and TS 28.558, RAN3 will not update the reference till the misalignments are solved**

(moderator - Nokia)

Summary of offline disc R3-243778

# 2 For the Chairman’s Notes

**There is a misalignment between TS 28.558 and TS 28.552 with respect to the entity that performs the measurements:**

* **The “Average delay DL air-interface” is measured by the gNB-DU in TS 28.552 and by NRCellCU (for non-split and 2-split scenario) and GNBCUUPFunction (for 3-split scenario) in TS 28.558**
* **The “Average delay DL in gNB-DU” is measured by the gNB-DU in TS 28.552 and by NRCellCU (for non-split and 2-split scenario) and GNBCUUPFunction (for 3-split scenario) in TS 28.558**
* **The “UL PDCP SDU Loss Rate” is measured by the GNBCUUPFunction and NRCellCU in TS 28.552 and by GNBCUUPFunction in TS 28.558**

**S-TMSI is not available in the gNB-DU and in the gNB-CU-UP**

**Reference to S-TMSI in TS 28.558 should be modified to 5G-S-TMSI**

**S-TMSI may not always be available in the gNB-CU-CP**

# 3 Discussion

In their LS related to improved KPIs that involve end-to-end data volume transfer time analytics, SA5 informed RAN2 and RAN3 that even though RAN specs (e.g., TS 37.320, TS 38.314) refer to TS 28.552 in the definitions of certain MDT measurements, all of the NG-RAN UE level measurements defined in draft TS 28.558 have been already supported by the MDT for NR (TS 37.320).

Towards this end, SA5 requested RAN2 and RAN3 to take this into account and consider future update of the references in relevant RAN TSs once the TS 28.558 is published.

After checking TS 28.558, RAN3 identified some issues that should be addressed before references of RAN specifications are updated.

## 3.1 Missing M4 measurement and other misalignments between TS 28.558 and TS 28.552

TS 37.320 refers to TS 28.552 for M4 measurement:

⁻ M4: PDCP SDU Data Volume measurement separately for DL and UL, per DRB per UE, see TS 28.552 [17].

There are two measurements in TS 28.552 that may have relevance:

* “DL PDCP SDU Data Volume” and “UL PDCP SDU Data Volume” in subclause 5.1.3.6.2 “PDCP SDU data volume Measurements”, or
* “Total number of UL PDCP SDU Packets” and “Total number of DL PDCP SDU Packets in gNB-CU-UP” in subclause 5.1.3.10 “Packet measurements”

While the first set of measurements is defined *per PLMN ID*, the second set supports "only user-plane traffic (DTCH) and only PDCP SDUs that have entered PDCP (and given a PDCP sequence number)”. It is therefore not clear which metric definition in TS28.552 should be referenced from TS 37.320 as measurement M4: PDCP SDU Data Volume measurement separately for DL and UL, per DRB per UE.Alternatively, a resolution could be to follow the SA5 guideline to update all the references in TS 37.320 for metrics M4-M7 to TS28.558.However, the definition of M4 measurement is missing from TS 28.558 [1], [3].

Furthermore, there seems to be a possible misalignment between TS 28.558 and TS 28.552 with respect to the entity that performs the measurements:

* The “Average delay DL air-interface” is measured by the gNB-DU in TS 28.552 and by NRCellCU (for non-split and 2-split scenario) and GNBCUUPFunction (for 3-split scenario) in TS 28.558 [1], [3]
* The “Average delay DL in gNB-DU” is measured by the gNB-DU in TS 28.552 and by NRCellCU (for non-split and 2-split scenario) and GNBCUUPFunction (for 3-split scenario) in TS 28.558 [1], [3].
* The “UL PDCP SDU Loss Rate” is measured by the GNBCUUPFunction and NRCellCU in TS 28.552 and by GNBCUUPFunction in TS 28.558 [1].

**Q1. Companies are asked to confirm the need to update the missing M4 measurement and correct the misalignments with respect to the entity that performs the measurements in TS 28.558 as described in section 3.1.**

|  |  |
| --- | --- |
| Company | Comment |
| CATT | Yes |
| Nokia | Yes |
| Ericsson | Yes |
| Huawei | Yes |
| Samsung | Yes.  For the misalignment, it is better for RAN3 to mention that content in 28.552 is reasonable. |
| ZTE | Yes |

## 3.2 S-TMSI feasibility

During the online discussion, some companies raised concerns regarding the feasibility of using S-TMSI as a UE identifier in TS 28.558 for every NG-RAN UE measurement. [1] discusses that according to their understanding S-TMSI is a short lived identifier that may change during the course of an MDT session and cannot be identified in the OAM. In addition, [1] mentions that S-TMSI is not available in the gNB-DU or in the gNB-CU-UP. During the online discussion another issue was raised, whether gNB-CU-CP would keep S-TMSI information.

**Q2. Companies are kindly asked to provide their views on the feasibility of S-TMSI as a UE Identifier for each of the NG-RAN UE level measurement definitions in TS 28.558.**

|  |  |
| --- | --- |
| Company | Comment |
| CATT | We think there are two issues that needs to further check with CT4  1: S-TMSI is not available in gNB-DU and gNB-CU-UP. Even in gNB-CU-CP, it seems not necessary to store S-TMSI. Instead, CU-CP just transfer S-TMSI to AMF when received via RRC message.  2 Whether including S-TMSI conflicts with the requirement of anonymity for M-based MDT |
| Nokia | First of all, it is our understanding that S-TMSI refers to 5G-S-TMSI. This would also need to be clarified with SA5.  As discussed in our paper this identifier is not available in the gNB-DU or in the gNB-CU-UP so it is today not possible to include this identifier for measurements measured in those entities.  In line with CATT’s comment, there is no reason for the NG-RAN node to store this identifier in the CU-CP because this information becomes obsolete if the CN changes the S-TMSI in the UE. This operation is transparent to the NG-RAN node and for this reason it is not clear how S-TMSI changes can be covered by the current signalling scenario.  Even if a gNB stores it, then this IE is changed at every MT triggered service request as specified in TS 33.501, section 6.12.1. and therefore cannot be used as a way to identify which collection records corresponds to a same UE in replacement of the TR/TRSR.  We propose to send the above understanding in our reply LS to SA5. |
| Ericsson | The only problem of concern to RAN3 is that the S-TMSI is not available at the gNB-DU and gNB-CU-UP. Hence RAN3 should expose this problem to SA5 and ask SA5 to provide guidance on how to address this issue.  On the duration life-span of the S-TMSI, it is true that the S-TMSI changes every time the UE changes AMF pool. However, this is also obvious. Namely, there is no UE identifier available at the RAN that is permanent for the UE and for that it is perhaps impossible to find a better temporary UE identifier than the S-TMSI. A permanent UE identifier would breach one of the main security principles established since 4G, which is that the RAN should not hold a permanent UE identifier. Hence, the S-TMSI is perhaps the best compromise between avoiding permanent UE identifiers at the RAN and providing an identifier that enables correlation of MDT measurements for a UE at least while the UE is within an AMF pool. Given that SA5 has selected this identifier according to their own needs (which are presumably fulfilled) RAN3 shall simply accept SA5´s choices and not question them.  Regarding anonymity, again, if this was a problem it would be purely for SA5 to discuss as SA5 is the group in charge of TS32.422, where anonymity requirements are described. SA5 is the group who has selected the S-TMSI for MDT measurements and SA5 is the group that selected the S-TMSI for MDT measurements. Hence, if SA5 has made such decisions they are fully aware of the implications on anonymity.  But for the sake of providing some constructive arguments, TS32.422 states that:  “*The anonymization procedure defines what information that is sent to AMF in order to control what UE related information the AMF is sending to the TCE in order to to enable correlation at the TCE.*”  Therefore, anonymisation conditions specified in TS32.422 apply to what the RAN sends to the AMF and NOT to what the RAN includes in a Trace File to be sent to the TCE.  In any case, the latter remains a topic not for RAN3 to discuss and totally within SA5´s domain.  In conclusion, we agree in stating that the S-TMSI is not available at the gNB-DU and gNB-CU-UP, but beyond that there is no other topic within RAN3´sresponsibility that can be flagged to SA5. |
| Huawei | We share the view from companies on the fact that we should clarify to SA5 the unavailability of the (5G-)S-TMSI at gNB-DU and gNB-CU-UP level.  However, we also agree with Nokia on the need to remind SA5 that the (5G-)S-TMSI is not a permanent UE ID in two dimensions, i.e., in both spatial (as it survived only if the UE moves within the same AMF pool) and temporal (as it is changed at every new service request or CN-initiated procedure such as paging) dimensions.  On the anonymization, maybe SA5 didn’t take care of this because, in our understanding, the anonymization principle applies to permanent UE IDs, not temporary ones. But this is just our understanding, therefore I do think it wouldn’t harm if we also raise this point to SA5 in the reply LS. |
| Samsung | Fine to point out the S-TMSI is not available at gNB DU and gNB CU-UP. |
| ZTE | First, we think we should mention that it should be 5G-S-TMSI instead of S-TMSI.  Then, we agree to point out that S-TMSI is not available at DU and CU-UP from RAN3 perspective. |

# 4 Conclusion, Recommendations [if needed]

If needed

# 5 References

[1] [R3-243488](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243488.zip), Discussion on Improved KPIs, Nokia

[2] [R3-243489](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243489.zip) [Draft] Reply LS to SA5 on improved KPIs involving end-to-end data volume transfer time analytics, Nokia

[3] [R3-243504](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243504.zip) Further discussion related to the Reply LS on improved KPIs, Ericsson, CATT

[4] [R3-243505](file:///D:\会议硬盘\TSGR3_124\Docs\R3-243505.zip) Reply LS on improved KPIs, Ericsson, CATT