3GPP TSG-RAN WG3 Meeting #110-e R3-206844

E-meeting, 2 – 12 November, 2020

**Agenda item: 8.3.1**

**Source: Nokia (moderator)**

**Title: CB: # 1\_QoSmonURLLC - Summary of email discussion**

**Document for: Approval**

# 1 Introduction

This paper provides summary of discussions at RAN#110-e on:

**CB: # 1\_QoSmonURLLC**

**E/// 6546:**

**- RAN does not report UL RAN part delay on NGAP.**

**- No impact on 38.415 is needed to satisfy SA5 requirement on RAN to provide UL packet delay result excluding UL D1 packet delay.**

**Nok 6377:**

**- Activation per PDU session; ENUMERATED enabling request of N3 packet delay reporting; measurement and reporting already supported by UP (N3/N9 packet delay requires an additional field; updating procedure text is needed); align st3 accordingly**

**HW 6423:**

**- introduce a reporting frequency configuration for RAN part delay reporting over NG on NG, Xn, F1 and E1 interfaces.**

**- discuss whether the reporting frequency in RAN should support the same definition as in TS 29.244 or a single periodic reporting frequency is sufficient.**

**- If a single periodic reporting frequency is agreed, the definition could reuse the reporting interval of M6, i.e., ENUMERATED (ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960, min1, min6, min12, min30 …)**

**- Chair: note LS; first clarify how reporting should work and foreseen specification impact**

(Nok - moderator)

Initial comments would be appreciated by Thursday, Nov. 5, EOB.

# 2 For the Chairman’s Notes

[To be completed]

# 3 Discussion

## 3.1 Reporting of RAN delay

### 3.1.1 Reporting of RAN delay over NG-C

As mentioned in 6546 and 6377, previous SA2 has agreed in CR to TS 23.501 [1]: "RAN measures the RAN part of UL/DL packet delay and calculates packet delay of N3 interface. RAN provides the packet delay of RAN part and N3 interface towards UPF (via N3)."

**Proposal: Reporting of RAN delay on NG-C is not needed.**

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| Company | Comment |
| Nokia | Agree |
| Huawei | Agree |
| Ericsson | Agree |

### 3.1.2 Reporting of UL packet delay result excluding UL D1 packet delay

An LS from SA5 [2] received at previous meeting contains the following action to RAN3:

"SA5 respectfully requests RAN3 to also provide an UL packet delay result by NG-RAN with focus on network side excluding the UL D1 packet delay occurred in the UE (UL PDCP queuing delay, as defined in the clause 4.2.1 of TS 38.314) for QoS monitoring."

Discussion can be found in 6546 (and already discussed at RAN3#109-e). 6546 indicates that measurements relative to the RAN part of the packet delay, excluding the UL D1 packet delay, are already defined in TS 28.552, and propose to reply back to SA5 that no further changes to RAN3's specifications are needed (6545). Support of SA5's request would require additional information to be defined in TS 38.415 (for NG-U and N9).

**Proposal: Reply back to SA5 that no further changes to RAN3's specifications are needed (draft LS in 6545).**

**Please provide your view.**

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| Company | Comment |
| Huawei | Agree. No further changes to RAN3 specs are needed for RAN part delay measurement without D1 for PM.However, the RAN part delay reporting to UPF for Qos monitoring for URLLC may not include D1 in a certain case, which is when the UE does not support D1 reporting. Reporting D1 is an optional UE capability as per RAN2 agreement.In such case, maybe better to indicate to UPF via NG-U about the absence of the DL in the UL RAN part delay result? |
| Ericsson | Agree. No further changes to RAN3 specs are needed for RAN part delay measurement without D1 for PM and draft LS in 6545 can be taken as baseline. As UEs capabilities are known to the CN we see no need to indicate absence of the D1 delay to UPF, as CN can deduce that UE does not report D1. |
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## 3.2 Configuration and reporting of N3/N9 delay

### 3.2.1 Reporting of N3/N9 delay over user plane

As mentioned in 6377, TS 23.501 contains a requirement to report N3 (NG-U) delay over N3 (see 3.1.1), as well as accumulated N3/N9 packet delay reporting up to the PSA UPF.

N3/N9 packet delay reporting requires additional support in TS 38.415, and a CR is proposed in 6378.

**Please provide your view on support of N3/N9 packet delay reporting over user plane, and whether the CR in 6378 is agreeable.**

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| Company | Comment |
| Nokia | N3/N9 packet delay reporting over user plane is needed. CR to TS 38.415 in 6378 can be agreed. |
| Huawei | OK to report the per interface delay to UPF via NG-U.Comment on the 38.415 CR in 6378:If a new indication is used, why to also use the UL delay indicator? Maybe better to use a separate indicator for the interface level delay reporting? |
| Ericsson | We think that the requirement on RAN to report the N3 delay is not necessary. 23.501 mentions that:“The UPF calculates the UL/DL packet delay of N3/N9 interface (N9 is applicable when I-UPF exists).”Namely, the UPF is also tasked to measure the GTP-U RTT and calculate the N3/N9 delay. UPF would report the delay to SMF. It is not necessary for RAN to measure the N3 delay because this measure consists of a GTP-U based RTT measure, i.e. this is exactly equivalent to the N3 delay measurement the UPF would take. We suggest to send an LS to SA2/CT4 to clarify that this requirement on RAN is not needed  |

### 3.2.2 Activation of N3 delay measurement

CRs for activation of N3 packet delay reporting for QoS monitoring using GTP-U path can be found in 6379 (NGAP) and 6380 (E1AP).

**Please provide your view on activation of N3 packet delay reporting and the submitted CRs (6379, 6380).**

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| Company | Comment |
| Nokia | 6379 (NGAP) and 6380 ( E1AP) can be agreed. Similar CR is also needed for XnAP. |
| Huawei | 6379 (NGAP) and 6380 ( E1AP) are implanted on top of the per Qos monitoring indication for Qos flow level.As we know that the N3/N9 delay is measured per interface. The question is do we need to active the per interface level RAN delay measurement on a per Qos flow granularity? |
| Ericsson | As mentioned above, we do not think the requirement on RAN to report the N3 delay is justified. We do not agree with the need for these CRs |

## 3.3 QoS Monitoring reporting frequency

LS from SA2 is received in 6838, and discussion is provided in 6423.

Please provide your view on the proposals in 6423:

**Proposal 1: To introduce a reporting frequency configuration for RAN part delay reporting over NG on NG, Xn, F1 and E1 interfaces.**

**Proposal 2: To discuss whether the reporting frequency in RAN should support the same definition as in TS 29.244 or a** **single periodic reporting frequency is sufficient.**

**Proposal 3: If a single periodic reporting frequency is agreed, the definition could reuse the** **reporting interval of M6, i.e., ENUMERATED (ms120, ms240, ms480, ms640, ms1024, ms2048, ms5120, ms10240, ms20480, ms40960, min1, min6, min12, min30 …).**

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| Company | Comment |
| Huawei | Agree. As per the SA2 LS, we need to define a reporting frequency for the RAN part delay reporting.We are open to the two options mentioned in the discussion paper. For simplicity reason, reusing the report interval for M6 seems better. |
| Ericsson | We note that in 29.244 it is specified that the UPF can report delay measurements to SMF with a minimum period of 1 second. This is captured in the description in 29.244 of Reporting Frequency, which relies on the measurement period parameter. See below:*8.2.42 Measurement Period**The Measurement Period IE contains the period, in seconds, for generating periodic usage reports or the periodic QoS monitoring reports.* Also note that the Minimum Wait Time is defined in seconds, see below:8.2.170 Minimum Wait TimeThe Minimum Wait Time IE contains the minimum waiting time between two consecutive reports for event triggered QoS monitoring reporting.[…]The Minimum Wait Time field shall be encoded as an Unsigned32 binary integer value. It shall contain the duration in seconds.Therefore, there is no reason to ask the RAN to report measurements with periods lower than 1 second. Also, the reporting period from RAN should be set in seconds, e.g. (s1, s2, s4, s8, …)Finally, there is no need to signal the reporting period to the gNB-DU. The gNB-DU collects its measurements and reports it to the gNB-CU-UP independently from the reporting period signalled by the CN. This is well stated in the LS from SA2 in 6838 as:*The measurement period of RAN part of delay is up to RAN’s implementation*To summarise we propose:* Signalling of the QoS Monitoring reporting frequency from AMF to NG-RAN over NG and from CU-CP to CU-UP over E1.
* A reporting period measured in seconds
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## 3.4 Stage 2

CR to TS 38.460 for completion of work at last meeting (D1 measurement transfer over E1) is provided in 6093.

**Please provide any comments on 6093 "Introduction of D1 measurement transfer on E1AP".**

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| Company | Comment |
| Huawei | Agree. |
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# 4 Conclusion, Recommendations [if needed]

If needed

# 5 References

[1] S2-2008236, *Correction to QoS monitoring for URLLC on GTP-U*, TS 23.501 CR#2475r1

[2] R3-205692 - S5-204537, *LS Reply on QoS Monitoring for URLLC*, SA5