**3GPP T****SG-RAN WG3 Meeting #110-e R3-210954**

**Online, 25th January – 5th February 2020**

Agenda Item: 8.3.1

Source: Ericsson

Title: Summary of Discussion for QoS Monitoring for URLLC

Document for: Discussion, Decision

# Introduction

A Summary of Offline Discussions has been assigned to the topic of QoS Monitoring for URLLC.

The discussion has been summarised as follows in the meeting minutes:

**CB: # 1\_QoSmonURLLC**

**ZTE**

**Add “stop” value in the QoS Monitoring Request IE in order to support Full control of QoS monitoring**

**SS**

**Adding reporting frequency to F1AP specification to support the RAN part delay reporting is required.**

**The indication of UL D1 delay reporting capability is required to inform UPF or SMF.**

**E///**

**Introduce a flag in UL PDU SESSION INFORMATION and ASSISTANCE INFORMATION DATA messages to indicate if a reported UL Delay Result includes D1 measurement or not.**

**measurement frequency for packet delay is up to RAN implementation.**

**HW**

**configure the reporting frequency to the gNB-DU via F1AP.**

**Indicate the absence of D1 delay in RAN part delay reporting data frame over NG-U**

**- Whether to impact UP protocol? (NG-U, Xn-U)**

**- F1AP impacts?**

**- other AP impacts?**

**- revise/merge CRs as needed**

(E/// - moderator)

Summary of offline disc [R3-210954](file:///C:\AppData\Local\Temp\Temp1_RAN3_111-e_agenda_with_Tdocs20210126_1005.zip\Inbox\R3-210954.zip)

# For the Chairman’s Notes

**[To be added]**

# Discussion

## Add “stop” value in the QoS Monitoring Request IE

In [1] it is proposed to add the value “stop” in the QoS Monitoring Request IE in order to stop reporting of QoS monitoring for URLLC measurements.

**Companies are invited to provide their view on whether the proposal in [1] is needed**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | Yes | This proposal allows to stop delay measurement reporting that would otherwise carry on indefinitely |
| ZTE | Yes | In order to reduce unnecessary resource occupation in the RAN side (e.g., release the monitoring resource over air interface), the QoS monitoring for the corresponding QoS flow should be allowed to stop. |
| Huawei | Need check with SA2 | From function pov, it seems the stop indication from AMF is needed.  However, we start our works based on SA2 LS and their stage 2 spec in TS23.501/23.502.  The cited spec in [1] is the interaction between AF and PCF. There is no any clue to imply the stop indication to RAN.  Therefore, a confirmation from SA2 is necessary to avoid wrong interpretation to CN specifications. |
| Nokia | No, this is not requested.  ->Yes | QoS monitoring anyway stops when the UE goes to idle mode, so an explicit stop seems like over-engineering. No such signalling on N4 (from SMF to UPF) as far as I could see.  ->after further checking, stop functionality is fully supported on 5GC interfaces |
| Verizon | Yes |  |
| Samsung | Yes | The value “stop” is needed to terminate the QoS measurement reporting to avoid the unnecessary reporting. |
| China Unicom | Yes | The ‘stop’ value is needed to reduce unnecessary resource occupation in the RAN side. |

If the answer to the above is “yes” companies are invited to comment whether an LS is needed to inform other groups of this decision

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Ericsson | No | An LS is not needed. The RAN3 specifications are clear enough to understand what RAN3 agreed |
| ZTE | Yes | Considering that such “stop” value comes from AMF, SA2 and CT4 needs acknowledge this and update the related specification, if needed. An LS to SA2 and CT4 is helpful. |
| Huawei | Yes | We have never replied the LS from sa2 yet. Therefore, we could send a LS to SA2 to summarize what RAN3 has done on this topic and with the issues that need to be clarified and confirmed. |
| Nokia | No | LS is not needed for the ‘stop’ codepoint. Such question can be raised by company contribution in SA2 if needed.  ->no need to bother SA2 with this simple alignment of RAN specification on CN specification |
| Verizon | Yes |  |
| Samsung | Yes | As the QoS measurement reporting is configured by CN, LS is needed to send to SA2. |
| China Unicom | Yes |  |

## Indication of support for UE delay measurements

In [2], [3] and[4] the problem of how to indicate to the UPF that the UE part of the delay measurement (D1 delay) is missing or is present in the reported measurements is described.

These papers propose to add an indication over the UP of whether the D1 delay measurement is present or not, based on the UE capabilities of the UE, i.e. based on whether the UE is capable of providing the D1 measurement or not.

**Proposal 1: It is proposed to agree to report a flag from NG-RAN to UPF indicating whether the D1 delay measure is included or not included in the UL delay results and to provide respective changes to TS38.415**

Companies are invited to provide their comments if Proposal 1 is not agreeable

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| --- | --- |
| **Company** | **Comments** |
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## Use of measurement reporting frequency

RAN3 has introduced a new IE over the NG interface, the *QoS Monitoring Reporting Frequency* IE.

Some excerpt from 38.413 explains the function of this IE:

*If the QoS Monitoring Reporting Frequency IE was included in the QoS Flow Level QoS Parameters IE contained in the PDU SESSION RESOURCE SETUP REQUEST message, the NG-RAN node shall store this information and, if supported, use it* *for RAN part delay reporting.*

[…]

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| QoS Monitoring Reporting Frequency | O |  | INTEGER (1.. 1800, …) | Indicates the reporting frequency for RAN part delay for QoS monitoring.  Units: second | YES | ignore |

In an LS from SA5 in [5] the following is stated:

*The SMF provides the* ***QoS Monitoring reporting frequency IE*** *to the RAN, and RAN is required to report the RAN part of delay result according to the QoS Monitoring reporting frequency. This reporting frequency can be used by RAN to determine the frequency with which the RAN reports to the 5GC the packet delay measurement of RAN part. The measurement period of RAN part of delay is up to RAN’s implementation.*

From the above it is clear that the *QoS Monitoring reporting frequency* IE is used by the RAN to determine the frequency with which the RAN delay measurements need to be signalled to the UPF. Namely, this IE is not meant to instruct the RAN about the frequency with which the RAN needs to perform QoS monitoring measurements.

To prove that this interpretation is correct, the LS from SA5 in [5] states that “*The measurement period of RAN part of delay is up to RAN’s implementation*”. Given that the measurement period of the RAN part of delay is up to implementation, there is no mandate posed by the reception of the *Measurement Reporting Frequency* IE on the frequency of the delay measurements.

During RAN3-110e it was explained that the decision in SA2 for which the measurement period of RAN part delay measurement is up to implementation is due to the fact that the CN is not aware of the status of the RAN and for that the CN should not request the RAN to perform measurements at a given frequency when the RAN may not be able to perform such task. The RAN could be in overload or the UE could be in poor radio conditions, hence it is up to RAN implementation to configure measurements depending on its status.

In [2] and [4] it is proposed that the *Measurement Reporting Frequency* IE is signalled over F1 to the gNB-DU in order to allow the gNB-DU to configure delay measurements with a frequency equal or higher than the Measurement Reporting Frequency.

In [3] it is proposed that, as per current RAN3 specifications and LS from SA2, the measurement frequency for packet delay is up to RAN implementation.

**Companies are invited to express their view on whether the Measurement Reporting Frequency IE should be used to set the frequency of the measurement of RAN part delay or whether the frequency of the measurement period of RAN part delay measurement shall be left up to RAN implementation**

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| --- | --- |
| **Company** | **Comments** |
| Ericsson | The frequency of the measurement of RAN part delay shall be left up to RAN implementation. There should not be a mandate from the CN to force the RAN to take delay measurements at a given frequency because this may lead to RAN overloads and to poor radio performance. The RAN is the best system to know its capabilities and radio conditions for the UE, hence the RAN should independently decide the measurement frequency. |
| ZTE | According to the LS from SA5, it clearly stated that The measurement period of RAN part of delay is up to RAN’s implementation. |
| Huawei | We think that sending the reporting frequency to DU does not contradict with the statement of RAN implementation in the LS.  If RAN likes, it may set a higher measurement frequency than the reporting frequency from AMF. So that a latest sample canbe available in RAN before each reporting period.  And if RAN is not able to follow, it may also set its measurement frequency as per its real load/resource situation.  IN our spec，we only say that the RAN/DU shall use the reporting frequency as per TS 23.501.  Is that acceptable for all? |
| Nokia | Agree with Huawei. It was not SA2's intention that the part of the gNB (gNB-DU) that does the measurements collection should not be aware of the requested reporting period. |
| Samsung | Agree with Huawei. The measurement frequency for RAN shall be left to implementation, but DU shall report the result based on requested reporting frequency to CU, which is beneficial for CU to collect the latest available result and report to CN. |

# Conclusion, Recommendations

# References

[1] R3-210061, Discussion on QoS monitoring control (ZTE Corporation)

[2] R3-210269, Discussion on QoS Monitoring for URLLC (Samsung)

[3] R3-210426, QoS monitoring for URLCC (Ericsson)

[4] R3-210434, Open issues for RAN part delay reporting for Qos monitoring for URLLC (Huawei)

[5] R3-206838, LS on Clarification on URLLC QoS Monitoring, SA2