3GPP TSG-RAN WG2 #130 R2-250xxxx

**St Julian’s, Malta, 19-23 May 2025**

**Agenda Item: 8.7.1**

**Source: Qualcomm Incorporated**

**Title: Summary of discussions on reply LS to SA4**

**Document for: Discussion**

# 1. Introduction

This document is to collect companies’ views on how to reply to SA4, in response to their LSes in R2-250339 (S4-250736) “Accuracy of PDU Set size and data burst size indication” and R2-2503340 (S4-250737) “Indicating Time to the Next Data Burst (TTNB)”.

The discussion will be conducted in two phases:

* In the first phase, companies are invited to discuss what should be included in the reply LSes. Please provide your input no later than **May 5 1800 UTC**.
* In the second phase, companies are invited to review draft for the reply LS, prepared based on the outcome of the discussion in the first phase. Please provide your inputs no later than **May 8 1800 UTC**.

# 2. Contact information

Please provide your contact information in the following table:

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **Email** |
| Qualcomm | Linhai He | linhaihe@qti.qualcomm.com |
| Futurewei | Yunsong Yang | yyang1@futurewei.com |
| Nokia | Benoist Sébire | benoist.sebire@nokia.com |
| CATT | Hao Xu | xuhao@catt.cn |
| OPPO | Zhe Fu | fuzhe@OPPO.com |
| Ericsson | Richard Tano | richard.tano@ericsson.com |
| Sharp | Sangkyu Baek | baeks@sharplabs.com |

# 3. Discussion

## 3.1 Accuracy of PDU Set size and data burst size indication

In LS in S4-250736, SA4 has asked RAN2 to provide the following:

* Accuracy limit requirements on the indicated PDU Set size in the RTP header extension. Please note that SA4 have documented potential solutions in TR 26.822, which offer varying levels of accuracy with errors ranging from ±0.1% to ±5%;
* The same on the indicated data burst size, as the causes to the inaccuracy in the indicated PDU Set size are also applicable to the indicated data burst size.

It is the rapporteur’s understanding that from RAN2’s perspective, the more accurate the indicated PDU Set size and the indicated data burst size are, the more efficiently RAN is able to configure and schedule its radio resources for the application. The rapporteur would first like to confirm whether this is the common understanding among companies.

**Q1. Do you agree that from RAN2’s perspective, the more accurate the indicated PDU Set size and the indicated data burst size are, the more efficiently RAN is able to configure and schedule its radio resources for the application?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Futurewei | Probably not | Assuming this feature is for DL, a gNB most likely will use DG for DL XR data and hence should be able to dynamically handle whatever amount of data received for transmission over the air, as they are received. We do not see such size indication being very beneficial for DL scheduling.  |
| Nokia | Yes but | Up to a practical limit. |
| CATT | See comments | From algorithm point of view, the more accurate information the gNB gets, the more helpful in some cases. But from reality point of view, as raised by Futurewei, there has some cases that the requirment is not so critical. This issue depends on the scenario which using these two parameters. Without consensus based on the use cases, we fail to answer this quesiton directly. |
| OPPO | See Comments | Theoretically, it is, but practically, it depends on the network strategy and use case. |
| Ericsson | No | It is helpful to recall why RAN2 requested SA4 to include PDU Set information in the RTP headers. The main reason was that RAN2 recognized the potential benefits of allowing the network to anticipate the amount of incoming data. This information could, for instance, help assess whether a PDU Set would be delivered within its bounded latency and plan resources or drop the PDU Set. In UL, this information is not helpful or useful in any case because the NW provides resources based on the BSR which is data available at the UE buffer. If the PDU Set Size has an uncertainty of 10%, for instance, the NW can take this into account when doing its evaluation. It may also be the case that not all flows at the UE include PDU Set information. Thus, an extremely accurate value will not be so helpful because, at the end, the NW will need to take into account other data for which size is not known beforehand. Having said so, the information and the accuracy needed should serve a purpose. A certain accuracy is needed but we cannot say with certainty that the more accurate the information is, the more efficient RAN will be.  |
| Sharp | Yes |  |

Next, companies are invited to provide their preferred accuracy limit for the indicated PDU Set size. In addition, please provide your justification in the Comments field, if possible.

To facilitate the discussion, the rapporteur suggests that we use the solutions already documented in TR 26.822 as the starting point. Of course, you are still welcome to provide any accuracy limit you prefer, whatever it may be.

**Q2. What is your preferred accuracy limit for the indicated PDU Set size? Please provide your justification too, if possible.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Accuracy limit** | **Comments** |
| Qualcomm | 0.1% of max PDU Set size | In our understanding, whatever accuracy limit SA4 chooses, no impact on RAN2 specs is foreseen. So the more accurate it is, the better. |
| Nokia | 1%~10% | Agree with Qualcomm that this has no impact on RAN2 specs. However, the PDU set size is intended to provide a rough estimate of how large the PDU set will be for the purposes of future resource allocation planning. It's not used to issue actual grants, so precision isn't very critical. Also, we do not see a strong justification why the accuracy should be above that of BSR. |
| Ericsson | 5-10% | While the accuracy will not impact RAN2, it will impact the RTP headers and their length. The larger the accuracy, the larger the RTP extension headers will be. As indicated in our previous response, we do not believe that the more accurate value, the more efficient RAN will be. For small PDU Set sizes, even 10% accuracy would be quite acceptable. For large PDU Set size, 5% as indicated in the LS could still work. The NW will just take into account the possible error range. Higher accuracy (2-5% - possibly for very large packets) is also fine but it is questionable how much value it returns for RAN. |
| Sharp | Up to SA4 or other WGs | The accuracy range depends on network operations over the N6 interface such as NAT46/64 and IP fragmentation. This can’t be decided by RAN2. |
|  |  |  |

For the indicated data burst size, it is the rapporteur’s understanding that the accuracy limit of PDU Set size and data burst size are very similar in nature. Therefore, in the interest of facilitating the discussion, the rapporteur suggests that we discuss whether the same accuracy limit may be used for the indicated PDU Set size and data burst. If in your view they should be different, you are welcome to provide it in your comment.

**Q3. Do you agree that the accuracy limit for the indicated PDU Set size and the indicated data burst size should be the same?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes | Accuracy of PDU Set size and data burst size have the same impact on gNB scheduling.  |
| Nokia | Yes |  |
| Ericsson | No | The burst is an aggregation of PDU sets. It is not so clear to us what the RAN is supposed to do with a burst as PDU Set information seems to be sufficient for resource planning and deciding whether the PDU Set will make it within its bounded latency. Thus, we would be ok having less accurate values for the burst.  |
| Sharp | Up to SA4 or other WGs | The accuracy range depends on network operations over the N6 interface such as NAT46/64 and IP fragmentation. This can’t be decided by RAN2. |
|  |  |  |

## 3.2 Accuracy of the indicated Time to the Next Data Burst (TTNB)

In LS in S4-250737, SA4 has asked RAN2 to provide quantitative requirements on the accuracy of the indicated TTNB value than those provided in LS R2-2407733, as this information is essential for SA4 to define TTNB appropriately.

It is the rapporteur’s understanding that from RAN2’s perspective, the more accurate the indicated TTNB is, the more UE power can be saved. The rapporteur would first like to confirm whether this is the common understanding among companies.

**Q4. Do you agree that from RAN2’s perspective, the more accurate the indicated TTNB is, the more UE power can be saved?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Yes/No** | **Comments** |
| Qualcomm | Yes |  |
| Nokia | Yes, but | Up to a practical limit. |
| CATT | Yes | Differnent to Q1, the use case for this TTNB is clearer to RAN2, hence, we support the current proposal. |
| OPPO | Yes, but | Up to a practical limit. |
| Ericsson | No | Similar reasoning as in Q1. Within a burst, there will be PDU Set and within a PDU Set, individual IP packets. The time to the next burst will always be relative due to the effect of traversing different networks and routers. Thus, a jitter will typically be there. Further, it has been established that XR services do have multiple flows. This means that even if there is a silent period in one flow, there might not be for another flow. Thus, it needs to be put in perspective. A certain level of accuracy is needed, but we cannot say that the higher the accuracy, the more UE power can be saved.  |
| Sharp | Yes |  |

Next, companies are invited to provide their preferred accuracy limit for the indicated TTNB (e.g. in msec). In addition, please provide your justification in the Comments field, if possible.

**Q5. What is your preferred accuracy limit for the indicated TTNB? Please provide your justification too, if possible.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Accuracy limit** | **Comments** |
| Qualcomm | Same as the shortest PDCCH skipping duration | If the next data burst is to arrive before the start of the next on duration, the network may reconfigure the DRX start offset to avoid extra latency. The granularity of DRX start offset is 1msec.If the next data burst is to arrive after the start of the next on duration, the network may either reconfigure the DRX start offset or schedule a PDCCH skipping. In the latter case, the minimum duration is 1 slot (whose absolute length is SCS dependent).Between the granularity of DRX start offset and the minimum PDCCH skipping duration, the latter is shorter and hence can be selected as the accuracy limit for the indicated TTNB. |
| Nokia | 1 slot | Agree with Qualcomm. |
| CATT | 1 slot  | We share the same view as QC. |
| OPPO | 1 slot | Agree with Qualcomm. |
| Ericsson | Few slots | As indicated above, a very accurate value will not really help the NW in realistic scenarios with multiple flows, with other users, etc. It will just hit the RTP headers for no reason.  |
| Sharp | 1 slot | Agree with Qualcomm |

# 4. Summary

For the question on the required accuracy of the indicated PDU Set size and data burst size, the views among companies are split. Three companies agreed that the more accurate the indications are, the more efficiently RAN is able to use them in its scheduling and configuration. Three companies commented that the benefits of high accuracy depend on use cases. A certain accuracy is needed, but it cannot be said with certainty that the more accurate the indications are, the more efficient RAN will be. One company did not think the size indications would be beneficial, as DL traffic is scheduled by DGs.

As to the question on the preferred accuracy limit, the selection covered the range from 0.1% to 5%. But most companies agreed that this accuracy limit has no impact on the RAN2 specs. One company commented that this limit can be up to SA4 and other WGs.

Based on these comments, the rapporteur would suggest that we reply to SA4 with the following:

|  |
| --- |
| From RAN2’s perspective, in some use cases, the more accurate the indications on PDU Set size and data burst size are (up to a practical limit), the more efficiently RAN may use them in its scheduling and configurations. But higher accuracy may not always guarantee higher efficiency for RAN. RAN2 agree that choice of accuracy limit for the indications on PDU Set size and data burst size does not have any impact on the RAN2 specs. An accuracy of 5% or lower is preferred, but the specific value in that range is up to SA4 to decide. |

For the question on the required accuracy of the indicated TTNB, all companies except one agree that the more accurate the indicated TTNB is, the more UE power can be saved. The preferred accuracy by all companies except one is the shortest PDCCH skipping duration, which is one slot. One company commented that a very accurate value will not really help the NW in realistic scenarios. A few slots may be sufficient.

Based on these comments, the rapporteur would suggest that we reply to SA4 with the following:

|  |
| --- |
| From RAN2’s perspective, since the TTNB can be used by RAN in its scheduling and configurations related to UE power savings, the more accurate the indicated TTNB is (up to a practical limit), the more UE power can be saved. More specifically, RAN2 recommends that the accuracy of the TTNB indication should match at least the shortest configurable PDCCH skipping duration, which is one slot (e.g. one slot in 120 KHz SCS is 0.125 msec). |