

[94e-47-R17-QoE-WI] - Version 0.0.4
RAN

3GPP TSG RAN#94e
RP-213624

Electronic Meeting, December 6 - 17, 2021

Agenda Item: 9.3.3.4

Source: RAN Vice-Chair (Deutsche Telekom)

Title: Moderator's summary for discussion [94e-47-R17-QoE-WI] on Pause/Resume for QoE reporting

Document for: Information & Decision

This NWM thread's timeline is based on the overall RAN#94e timeline provided by the RAN Chair

This NWM thread discusses the question if RAN WGs (in particular RAN2) should continue work on QoE pause/Resume in Rel-17 or not.

This NWM thread does NOT discuss the technical details (again) as these are already documented in the recent RAN2 reports and in RP-213200 (China Unicom, Ericsson, Huawei, HiSilicon, ZTE), RP-213377 (Apple) and RP-213234 (Lenovo, Motorola Mobility) which are basis for this discussion.

1 Initial Round: Continue Pause/Resume for QoE reporting in Rel-17 ?

Given the technical discussion which happend already in RAN2 meetings and has been documented in the RAN2 meeting reports and considering the current load situation and the fact that we are facing the end of Rel-17 work in RAN2 in 1Q2022 (with only 2 meetings) RAN plenary should decide between these 2 options:

Option 1: Continue specifying the pause/resume functionality in R17

Option 2: Remove the pause/resume functionality from Rel-17

So, please indicate your company's preference for Option 1 or Option 2 in the form below - without repeating the entire RAN2 technical discussion.

Feedback Form 1: How to continue with Pause/Resume in Rel-17

1 – Samsung Electronics Co.

Option 1: we are fine to continue specifying the pause/resume functionality in R17 next quarter.

2 – Beijing Xiaomi Mobile Software

Option 1: we are ok to continue specifying the pause/resume functionality in R17.

3 – HuaWei Technologies Co.

Option 1: We are fine to go for option 1, as we have two meetings in Q1 for RAN2 and it is still possible to conclude the solution.

4 – MediaTek Inc.

RAN2 Chair:

Please be aware that the issue come up in RAN2 in the following circumstances.

- a) RAN2 had asked SA4 about the feasibility of specifying storage of generated reports during Pause by the application.
- b) SA4 replied, with some quantitative numbers (which was new) showing that QoE reports are generated sparsely/not often and are small relative to data volumes generated by codecs, and expressed doubts whether pause resume is actually needed, and asked also some further questions.
- c) At last RAN2 meeting, there was an offline to further reply to SA4 ask them to continue and explain better the motivation for Pause Resume etc
- d) RAN2 couldn't agree on a motivation for Pause Resume. At online CB in R2, in fact not even proponents could give a reasonable explanation, and as the R2 Chair could not accept an LS out to SA4 explaining that there is no justification for Pause Resume but it is wanted anyway, this was put on hold in RAN2.

SO, my COMMENTS:

1/ in order to determine this I think the justification may need to be discussed.

2/ Comment to a comment above: If the work continues, I assume that the SA4-involved design shall be continued, asking SA4 to update their specifications as well.

5 – China Unicom

As the rapporteur of Rel-17 NR QoE WI, I'd like to say thank you for RAN2 Chairman raise the good question to check for the justification on supporting pause and resume functionality in Rel-17 NR QoE WI. Although the motivation and justification had been approved in RP-210913 of RAN#91-e(Mar.21) meeting , the short answer is that, following the conclusion of Rel-17 NR QoE SI, QoE measurement handling at RAN overload need to be specified in work item phase.

If we go back and check what is RAN3 work during study item phase, QoE measurement handling at RAN overload was firstly agreed in RAN3#110-e meeting(Dec.20) and captured in TR 38.890 V0.2.0 as “ In case of RAN overload in standalone connectivity, RAN can stop new QoE measurement configurations, release existing QoE measurement configurations and pause QoE measurement reporting. FFS for details under EN-DC/MR-DC operation.”

SA5 had sent the LS to RAN2/RAN3/SA4 name as “LS on QoE Measurement Collection” in R2-2005778/R3-206919/S4-200962. It was clearly captured that “

As there will be assurance and other automated functions using the QMC mechanism in 5G in Rel-17, the functionality to provide QoE Reference both inside and outside the container to enable multiple simultaneous measurements and the temporary stop/restart QMCs are needed:

- **It is considered vital that QoE data is captured during time periods of RAN overload. However, there can be many consumers that frequently collects QoE data from many UEs. To not contribute to the RAN overload, the QMC reporting should be able to be temporarily stopped and restarted. ”**

Temporary stop and restart of QoE information reporting during NR overload is specified in chapter 5.4.6 of TS 28.404 v16.2.0 as a high level use case of R16 SA5 specification. From the RAN WGs, we have to follow up SA5 requirements and support it.

According to SA5 agreements, RAN3 had agreement on pause QoE measurement reporting in RAN3#110-e meeting(Dec.20).

In Rel-17 NR QoE WI, pause and resume functionality had been agreed as one objective to be specified in R17, so there is no reason for RAN WGs to doubt about the conclusion and requirement from SA5 anymore.

In addition, from our view, supporting pause and resume functionality may bring the flexibility for gNB together with UE to control the transmission of QoE reporting in medium or high traffic load scenarios. We think the pause and resume functionality is beneficial for network managements. UE can transmit the QoE report when the traffic load of gNB is low.

As we have only two RAN2/RAN3 meetings left in 22Q1, companies are encouraged to converge on the technical solution in RAN WGs discussion.

6 – China Unicom

We support Option 1: Continue specifying the pause/resume functionality in R17.

7 – VODAFONE Group Plc

If the QoE data rate is (as I think SA4 indicated) around 100 bit/s, then [RRC] signalling for pause/resume might cause more overload than just handling the data flow. Hence we think that it would be OK to not specify pause/resume. (However, this is much more a preference and not an objection.)

8 – Deutsche Telekom AG

Deutsche Telekom agrees with Vodafone here, the overhead of signalling might outweigh the savings. IF the functionality should be introduced in Rel-17 it should be an extremely simple one with minimum impact on the specs and the Uu interface.

9 – CATT

option1, We are fine to continue specifying the pause/resume functionality in R17

10 – China Telecommunications

Option1. We think the pause/resume functionality can bring more flexibility of NW.

11 – ZTE Corporation

We are fine to go for Option 1. There are two meetings left and long term email discussion can be leveraged to achieve consensus.

We share the view from China Unicom that the Pause/Resume requirements originally comes from SA5 and confirmed in RAN (RAN3 first start the discussion and then agreed in RAN plenary). Regarding the solutions part, we also prefer a simple solution with minimal impact on specification. For example, it is possible for NR QoE to reuse buffer mechanism as Logged MDT in UE AS layer.

12 – Nokia

We are fine with Option 1 (Continue specifying the pause/resume functionality in R17). If pause/resume cannot be concluded during the next quarter, then the functionality can be safely pushed to R18.

13 – MediaTek Inc.

Option 2: As indicated by SA4, the load generated by QoE reporting is extremely low. So we think the gain of pause-resume is really marginal. Since the usefulness is questionable and given the timeline to complete R17, we prefer not to continue it. If needed, this could be discussed in R18.

14 – Apple Switzerland AG

Option 2. The discussions on benefits as well as details including where measurements are stored were both highly contentious in RAN2, it's expected RAN2 will not be able to converge easily in Q1'22.

15 – China Unicom

As clarified for many times during RAN plenary and offline discussions, the pause and resume functionality is defined by SA5. This requirements is sent from SA5 to RAN2/RAN3 in 2020, the requirements are approved in RAN plenary as one objective. From China Unicom's position, we cannot accept to removal and stop specifying this objective if the concern is not from the technical point of view.

We are all very clear one company has strong negative view on supporting pause and resume functionality by the end of Rel-17. In RAN plenary, companies always have different preferences on some specific objective or solution. But we are not feeling comfortable for blocking this objective which is clearly including the formal approval work item. My understanding on the objective approved in the WI is that the whole eco-system partners are agreed to work on this way, and we should complete it as we promise. If the approval WI is not the consensus and the objective can be challenged anytime like this, what is the meaning when we discuss about the objective and approval for every work item in every release?

In fact, SA5 has support pause and resume functionality in Rel-16 specifications, and RAN plenary agree to specify this functionality in R17. We share the similar view with companies to continue working on specify the solution with minimum spec impacts. If companies interest, please check with the status report of NR QoE, RAN3 has good progress on pause and resume functionality.

16 – China Mobile Com. Corporation

Option1. We share similar view with China Unicom that the operators should be provided with such flexibility on the configuration of pause and resume.

Firstly, the QoE collection during RAN overload is important to understand the QoE performance so we cannot simply perform QoE release during RAN overload.

Secondly, if we continue QoE reporting during RAN overload without pause, it may make the overload condition even worse. Note that although a general QoE measurement session will generate less than 100bits/s for the QoE report,

1. we still have multiple simultaneous sessions to be reported, and
2. the reporting interval for a QoE session could be as long as, say in the order of several minutes, and
3. there could be multiple UEs configured with QMC for a specific cell, and
4. 100bit/s is a general statistics for streaming, and SA4 is also discussing XR service which is expected to generate higher rate for QoE reporting.

Then the overall load introduced by QoE report during RAN overload cannot be negligible by considering these scaling factors. And RAN should be able to decide when/which to pause and when/which to stop based on e.g. the total number of QoE configurations, and potentially the reporting interval, etc.

17 – QUALCOMM JAPAN LLC.

We support option 2.

The complexity and the time necessary to discuss and standardize the feature is not well justified by the use cases. Even logical channel prioritization today allows suppressing low priority data to go through, which SA5 or SA4 may not have realized.

It can be discussed in release-18, but "only if" compelling use case is identified.

18 – Intel Deutschland GmbH

We think QoE Pause/Resume should be de-prioritized (option 2) in Rel-17 due to the following reasons:

1. SA4 replied that the average QoE load per application is smaller than 100bits/sec, QoE Pause/Resume for RAN overload situation may not be useful/effective due to low throughput of QoE reporting.

2. RAN2 cannot conclude the typical duration of a temporary stop and how this is helpful to RAN overload during last RAN2 meeting. Due to limited TU of remaining Rel-17 and controversial solutions for RAN overload (e.g. store QoE report in application layer or AS layer during QoE Pause), it is suggested to deprioritize QoE Pause/Resume in Rel-17.

3. For RAN overload situation, if needed, RAN2 has agreed QoE release can be used by NG-RAN. Moreover, the network can also release the service itself during overload situation. Hence, QoE Pause/Resume is not essential.

19 – vivo Mobile Communication Co.

We agree the average QoE load per application may not be significant. But, we think pause/resume may provide operators with more flexibility on the QoE reporting. So we think Option 1: to continue discussion on pause/resume functionality in R17.

20 – Guangdong OPPO Mobile Telecom.

Considering the flexibility on the QoE report, avoiding frequent configuration release/re-configuration, we prefer to pursue the Option 1: to continue discussion on pause/resume functionality in R17

21 – China Unicom

We want to clarify the misunderstanding on the meaning of "**QoE load per application**":

The LS from SA4 also evaluate the QoE load per application (R2-2106775/S4-211058):

Will pausing of QoE reporting during RAN overload effectively help the RAN, given that the average QoE load per application is <100 bits/sec?

The LS from SA4 indicate that one VR QoE report size is about 18kB (R2-2109386_S4-211291).

SA4 has evaluated one possible VR metric collection test, and with reporting every ten minutes the resulting zipped report container is then about 18 kB in size.

The QoE load evaluate by SA4 is the QoE report generate rate for streaming, for VR traffic, the single QoE report size is about 18kB which is evaluated by SA4. Since 100bits/sec is the generate rate of QoE report, it is not equal to the data rate over the air interface. Multiple QoE can be configured for one UE, with considering the max No. of configured QoE configuration per UE is 8 64, pausing QoE reports can

help network to relieve uplink traffic load when there are a large number of UEs (e.g. VR broadcasting), the QoE reports will make network performance even worse.

22 – ZTE Corporation

Additional comments: The benefits of the Pause/resume function should not be considered only from the Uu interface, but also from the system point of view. Because there are multiple QoE-Consumer in the network, it is possible that multiple QMC of many UEs in the same cell are measured and reported simultaneously. When the RAN is already in overload, the reporting of concurrent QoE result of a large number of UEs further increases the congestion level of the RAN.

23 – Ericsson LM

We support Option 1.

Room for further considerations:

Feedback Form 2: Further comments if necessary

2 Report from Initial round and Conclusion

17 companies provided input. 12 companies indicated that they support the Option 1 to continue and specific Pause/Resume in Rel-17, 2 operators indicated that this should not be specified if the required signaling outweighs the gains and 3 companies indicated that it should not be progressed in Rel-17

Conclusion: Clear majority of companies supports the specification of the Pause/Resume functionality in Rel-17, while 3 (5) companies do not support this, out of which 2 (the operator) indicated that it is important to qualify the benefits vs. signaling overhead of the solution.

Technical discussion should be left to RAN2 which needs to also involve RAN3 and SA4 on the matter. It is proposed by the moderator to continue the specification work in Rel-17 focusing on a solution which provides overall benefits and not “eat up“ the potential gains by increased signaling.

3 Intermediate Round

In order to efficiently use the time, this round is based on the assumption that Pause/Resume will be continued in Rel-17. The following form allows companies to outline an action plan for the next RAN2 meeting to quickly progress to an agreeable solution.

If RAN2 chair thinks this should be left to RAN2 discussion he should please indicate this early in this round and we close the thread.

Feedback Form 3: Outline of action plan for RAN2

1 – MediaTek Inc.

RAN2 Chair:

As indicated in the RAN2 Report it is sufficient that Plenary indicates whether to continue or not with Pause Resume. I believe that more detailed guidance will require discussions that are maybe too detailed to be efficient at Plenary. On the proposed signalling aspect, RAN2 hasn't really decided how frequent the signalling will be. Normally AS load control mechanisms work on a quite tight time scale, but there has been opinions expressed in RAN2 that Pause resume shall work on time scales of hours, which makes it somewhat different to other mechanisms. I don't believe RAN2 will have the TUs for this Item to really assess the gains or make well founded assumptions on how to use the function in detail and this was not done in the Study Item either, but it seems possible to conclude the work anyway just based on companies' opinions.

4 Report from Intermediate round and final Conclusion

The only comment received in the intermediate round was from RAN2 chair, indicating that moderator's proposals to continue to work on Pause/Resume in Rel-17 should be considered as RAN decision.

The work in RAN2 will continue with details on the signalling, but due to time constrains the gains and the details of usage are unlikely to be discussed.

With this the NWM discussion is closed.