3GPP TSG-RAN WG3 #114-e [R3-215867](https://ericsson-my.sharepoint.com/personal/filip_barac_ericsson_com/Documents/WORK/3GPP.exe/Meetings/RAN3%23113-e.exe/Meetings/RAN3%23113/chairnotes/Inbox/R3-214141.zip)

Online, 01 – 11 Oct, 2021

Agenda Item: 15.2.1.2

Source: Huawei (moderator)

Title: Summary of Offline Discussion on CB: # QoE3\_Configuration\_Report

Document for: Approval

# Introduction

**CB: # QoE3\_Configuration\_Report**

**- Check progress from other groups**

**- Discuss the detail information included in QoE configuration and report**

**- How to support per slice QoE measurements?**

**- Prioritization mechanism?**

**- Further discussion on RAN overload handling**

**- TPs if agreeable**

**- Capture agreements and open issues**

(HW - moderator)

Summary of offline disc [R3-215867](file:///C:\Users\y00239572\AppData\Roaming\Microsoft\Word\Inbox\R3-215867.zip)

# For the Chairman’s Notes

**For chairlady to copy:**

Detailed discussions

# Discussion [if needed]

Similar as what we did for previous meeting, the discussion will try to discuss the further details on the following topics: activation/deactivation, other configuration details on remaining open issues for slice configuration and reporting, overload handling, RAN visible QoE, radio related measurement&information and other miscellaneous points, the discussion will take the papers from [1] to [26] into account.

Please note that, for other topics which might impact NG, e.g. mobility support, we also have dedicated CB, for which moderator would leave the discussion there.

## Activation and deactivation

Moderator’s note: Since RAN3 received the LS from SA5 about their understanding on the activation and deactivation of QoE measurement, and there is another dedicated CB on activation and deactivation (CB: # QoE2\_Activation\_Deactivation), moderator would suggest we just wait the outcome of that CB and capture the agreement into the TP. Here maybe the only thing is to discuss is if it is enough to include QoE Reference in the Deactivation message.

### QMC Deactivate Message just includes a list of QoE Reference?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | Yes | QoE Reference is globally unique, so simply indicating QoE Reference should suffice |
| ZTE | Yes | A list of QoE Reference would be enough. |
| Huawei | Yes | We think QoE Reference is a unique identifier to represent a QoE measurement for a certain service type |
| Samsung | Yes |  |
| China Unicom | Yes | QoE reference is enough in the Deactivation message. |

## Other configuration details

### Is there a need to introduce configuration modification procedure for the QMC over NG

This is mentioned in the RAN3 reply LS [25] but not concluded since RAN3 would like to check with SA5, since now RAN3 received LS from SA5 [26], RAN3 should provide an answer, companies are invited to provide your view.

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | Not yet | SA5 replied in [26] that “*SA5 does not specify the modification procedure for QMC so far (in UTRAN and LTE), existing deactivation and activation procedures could be used to modify the QMC. If RAN2 agree to consider QMC modification scenario, then whether modification of QMC is needed for NR in SA5 or not may require further study.”*  Also, RAN3 also sent LS in R3-214471 to SA5 enquiring about modification in slice scope change, for which it has not received a reply yet. So, we propose to wait for SA5 reply to R3-214471 before discussing whether this is a need to introduce QoE modification. |
| ZTE | No | From the reply[26] of SA5, We don’t see any requirement from SA5 for the modification procedure. In our understanding, which is also mentioned by SA5, the activation and deactivation procedures would suffice, for modifying the existing QMC configuration, i.e., to deactivate the old configuration and activate with a new configuration. |
| Huawei | No | In LTE QMC, RAN3 only specifies the activation and deactivation procedures for the QMC. RAN3 does not specify the modification procedure for the QMC. Technically, the simplest way is to deactivate and activate with new configuration. |
| Samsung | No | As SA5 states they doesn’t specify modification procedure, and according to RAN2’s reply LS (R3-213124), “*RAN2 does not see the scenario that a QoE measurement configuration already configured in the UE will be modified for e.g., a certain service type or a QoE Reference, and assumes modification is not supported in RRC signalling. RAN2 would like SA5/RAN3 to confirm this assumption.*”  Based on the above, RAN3 can confirm that there is no need to introduce modification procedure. |
|  |  |  |

### The QoE reference and MCE IP address are configured per QoE measurement

Moderator’s Note: In order to be precise, here the message structure goes like the following:

1. There is an IE named *UE Application layer measurement configuration List*, including a list of QoE measurements
2. For each QoE measurement in the list, there are IEs including: *QoE reference, Measurement Collection Entity IP Address* and Service Type, where the *QoE reference* is a unique ID.

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | Yes | RAN3 should follow SA5 reply LS and should support the configuration of the Measurement Collection Entity IP Address per QoE Reference |
| ZTE | Yes | Share the view with QC. RAN3 should follow the reply LS from SA5. |
| Huawei | Yes | The main intention of adopting this structure is mainly for the flexibility of signaling design, thought it might be rare case that configuration for different service type comes from different MCE/TCE. |
| Samsung | Yes | Just follow SA5’s understanding |
| China Unicom | Yes | According to reply from SA5, Measurement Collection Entity IP Address should configured per QoE Reference, and each QoE measurement should have a unique QoE Reference. |

### Whether to introduce a measurement configuration application layer ID over NG

Moderato’s Note: RAN2 agreed to introduce this IE over Uu, here the question is about whether there is a need to copy this IE in the configuration message over NG, other proposals related to this IE are left to the CB on mobility.

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | No | measConfigAppLayerID is the shortened version of QoE Reference used while sending QoE configuration over Uu.  The mapping between measConfigAppLayerID and QoE Reference is maintained locally at NG-RAN and might be propagated to a target node upon mobility and this can be discussed in the CB on mobility. But we don’t any other reason to include this measConfigAppLayerID over NG. |
| ZTE | No | Measurement configuration application layer ID is introduced by RAN2 over Uu, for more efficient radio transmission. From RAN3 perspective, QoE Reference is enough to work as the identifier of QoE configurations, where NG-RAN node stores and maintains the mapping between measConfigAppLayerID and QoE Reference. There is no need to introduce another ID over NG, which would mess up the configuration. |
| Huawei | No | As commented, as far as configuration is concerned, we have QoE Reference for each measurement, whether to include this over Xn (or an IE inside container over NG) is another thing. |
| Samsung | No | The mapping relation between measConfigAppLayerID and QoE Reference is kept in RAN, no need to involve CN. |
| China Unicom | No | QoE Reference is enough for QoE configuration over NG. |

### Agree that MBS and XR service types are not pursued in Rel-17 NR QoE management.

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | Yes |  |
| ZTE | Yes |  |
| Huawei | Yes | We could revisit this during normative phase of R18 WI. |
| Samsung | Yes | Overlapped with CB#2 |
| China Unicom | Yes |  |

### Whether to introduce the criteria, e.g. time-based, threshold-based or, event-based, for RAN to trigger/stop the QoE measurement

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | No | OAM can trigger/stop QMC based on its own implementation and there is no need to standardize any new time/threshold/event-based criteria and signal it to NG-RAN or UE.  Also, application layer already configures some time-based criteria for QMC within the QoE configuration container, e.g., via defining Measure-Resolution and Measure-Range for MTSI services. And some event-based criteria are being discussed under RVQoE and should be discussed in that CB. |
| ZTE | No | If RAN really needs to check some conditions before sending the configuration, e.g., for m-based QoE, we think this can be done by implementation. Besides, considering that there has been triggering conditions in application layer, as mentioned by QC, we don’t see the need to add the criteria in RAN side.  Anyway, this is not a high priority issue in our understanding, which can be left to R18 if needed. |
| Huawei | No | Actually in the QMC container, application layer configured some criteria for the UE to conduct this QoE measurement task, from UE AS layer, it should just transfer to application layer when QMC is received.  For the time-based criterion, we think the OAM can send the command based on the time. RAN3 does not need to specify it.  Also we have one concern on these triggering conditions: if RAN uses these triggering conditions, RAN will trigger the QoE measurement after the service has been started for a while. We are not sure whether it can satisfy the requirement of SA4, because the QoE result will only collect part of QoE results of one service session. |
| Samsung | Yes | We see benefits by introducing event-triggered condition, we may not consider time-based condition, it’s already supported as QC commented.  We think Operators are very concerned on the special coverage scenarios in their daily optimization works, such as high interference scenario and high speed scenario.  Those scenarios are related to the radio condition of UE, but let OAM or gNB to check the condition is not a good choice. The best way is to send the trigger condition along with QoE configuration to UE, and let the UE who is directly going through the radio environment check the condition, then the concerns from ZTE and HW can be solved.  We believe introducing these event-triggered condition can achieve more targeted and efficient QoE collection to help network optimization |
| China Unicom | No | Criteria in QMC container can be used for application layer QoE reporting. |

## Slice configuration

It was agreed in last meeting to introduce slice info as an explicit IE over NG as part of configuration, the remaining issues are about how slice info is configured over Uu, how to reflect the slice info in reporting, and how to be handled in RAN visible QoE report.

Moderator’s note: 1) for the answers to the questions below, the answer could also be left to RAN2; 2) it is suggested to leave the issue that whether slice info should be included in the reporting container to SA4 (according to the LS, SA4 is considering this issue).

### Whether the slice ID should be configured as an explicit IE to UE over Uu?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | No | SA4 reply LS in **R3-214716** states that a *QoE client can identify the PDU session and the corresponding S-NSSAI and DNN, over which the QoE session is running via the +CGDCONT? AT command*.  RAN3 concurs from SA4 reply that **UE Application is aware of the mapping between the slice and service type**  Hence UE access stratum doesn't need to do any slice scope check and there is no need to include any slice related identifier (e.g., S-NSSAI) as an explicit IE to UE over Uu. |
| ZTE | No | Share the view with QC. From the reply LS of SA4, application layer is aware of the mapping between slice and service type. So there is no need to add the slice info outside the container over Uu. Slice info inside the container over Uu is enough. |
| Huawei | Yes | In our understanding, the RAN will check the slice scope to decide whether to send the QoE configuration to the UE and the RAN may select to measure parts of slices within the slice scope based on the maximum number of QoE measurement supported by the UE or based on others. Therefore in this case, if the slice information is also included in the QoE configuration container, the UE will still perform the QoE measurement for all these slices. The behaviors of UE will not align with the purpose of the network. |
| Samsung | Either in the container or out of the container | In our views, the slice scope should also be checked by UE Application, because the serving slice for one service may change during the session as replied by SA2.  Regarding how UE check the slice scope, there may be two options:   * Option 1 include slice scope in the container, the same as LocationFilter in QoE metrics, this should be checked with SA4, * Option 2 include slice scope out of the container (an explicit IE over Uu), AS layer send the slice scope to Application, this should be check with RAN2.   We prefer option 1, but if option 1 is not work, we should go option 2.  But we can check this with SA4 and RAN2 at the same time.  To clarify option 2, if companies have doubt on the knowledge of different layers of UE, e.g. how the received slice scope is known by Application layer, let’s do not forget the LocationFliter in Application layer, which means the Application can know the serving cell information, if so, Application can know other information in AS layer. |
| China Unicom | No | From SA4 reply that Application is aware of the mapping between the slice and service type, and the slice scope should be checked by application layer.  For the concern mentioned by Huawei, we think the OAM should ensure the maximum QoE configuration, or the behavior of UE application layer will not align with the purpose of the network. |

### Whether the slice ID is included in the transparent reporting container or not?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | Upto SA4 | SA4 reply LS in **R3-214716** states that *SA4 is considering updates to its QoE report format to include the S-NSSAI and DNN, whenever available*.  Hence RAN3 can assume that a slice related identifier will be included within the QoE report container and can send LS to SA4 to confirm. |
| ZTE | Yes | According to R3-214716, the slice id would be included inside the container. |
| Huawei | Yes | Technically it would be useful for the OAM to understand the whole situation, but we are also ok to leave this to other group, since it is not a RAN3 decision but just suggestion. |
| Samsung | Yes | As per reply LS from SA2, the serving slice may change during the session, it’s better to include the slice information in QoE report. If this is agreeable, we should send LS to SA4 to check this as well. |
| China Unicom | Yes | Slice ID included in the transparent reporting container can be used for OAM, and also according to reply from SA4 in R3-214716, we think slice ID should be included in the transparent reporting container. |

### Whether to include the slice ID as an explicit IE together with QoE reporting container?

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | No | It is not clear on the benefits to include a slice related identifier as an explicit IE in the QoE report sent to NG-RAN as **slice related optimizations are mostly under the control of OAM**. Hence, there is no need to include any slice related identifier (e.g., S-NSSAI) outside the QoE report container over Uu i.e., visible to NG-RAN |
| ZTE | No | For RRM optimization based on RVQoE, considering the case that some PDU sessions might be corresponding to the same slice ID, PDU session information is of more use for the RAN to know which PDU session the report is associated with. So, we suggest to replace slice ID with PDU session ID . |
| Huawei | Pending | For pure per-slice measurement, as long as slice info is included in the there is no need to include outside again; however, if there is no slice info inside reporting container, then an explicit IE of slice info is needed, over both Uu and NG when reporting QoE measurement results. |
| Samsung | Pending | Same view as HW. |
| China Unicom | No | Share the same view with ZTE. |

### Whether PDU session(s) information should be included outside of QoE reporting container

Moderator’s Note: This might be overlapped with the CB: # QoE5\_RANVisible, companies could also share view here, moderator’s could coordinate to compose the final conclusion.

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | Discuss in CB #5 | We propose to discuss this in CB: # QoE5\_RANVisible |
| ZTE | Yes | As commented above, PDU session information is of more use for the RAN to know which PDU session the RVQoE report is associated with.  We are fine to discuss this in CB#5 : ) |
| Huawei | Yes | Different PDU session may have the same slice ID. Therefore we think the UE can report the PDU session information together with the RAN visible QoE. In our understanding, the UE application layer does not know the DRB information. Therefore it is better that the QoS flow information is also reported in order to confirm the DRBs that need to be optimized. According to the LS [5] from, the UE application layer can know the PDU session information, but we are not sure whether the application layer can know the QoS flow information. |
| Samsung | Discuss in CB #5 | Let discuss this in CB#5. |
| China Unicom | Yes | According to the LS reply from SA5, the UE application layer can know the PDU session information, it can be reported together with the RVQoE, gNB can get the mapping information between PDU session and DRB. |

## Handling in case of RAN overload situation

There are many papers to discussion the case of RAN overload situation, including whether there is a need from OAM to configure something, is there a need to configure to the UE, and guidance needed for the UE to resume the reporting, etc.

### Whether to introduce prioritization mechanism of different service types or slices from OAM side, for RAN to consider to release or pause in case of RAN overload situation

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | No | We think that introducing a prioritization mechanism is unnecessary as the RAN node could control which service reporting is to be suspended or resumed based on its own implementation or preference. For example, an NG-RAN might choose to pause QMC for DASH streaming first and keep QMC for VR service running whereas this might not be desired by another NG-RAN. |
| ZTE | No | The RAN itself can know which QoE measurement to suspend by itself. For example, the RAN can suspend those with large report size or frequent report period. Actually in our understanding, the QoE reports would not have much influence on the overload situation. A prioritization mechanism may not be of much necessity.  Anyway, this can also be considered in R18 if needed. |
| Huawei | Yes | If the RAN overload is not very high, we think the RAN can select parts of QoE measurement to release or pause based on the priorities due to different operators’ strategies. |
| Samsung | No | Prioritization can be realized by implementation |
| China Unicom | Yes | Share the same view with Huawei, and we think OAM can define the priority of the QMC to guarantee the experience of high priority users. |

### Whether to introduce prioritization mechanism of different service types or slices for the UE to send pending QoE reports after RAN overload is solved

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | No | For the sake of simplicity, there is no need to define and indicate a prioritization list among different service types or slices to assist NG-RAN or UE to send pending QoE reports post RAN overload. |
| ZTE | No | As commented above, we think the QoE reports would not have much influence on the overload situation. A priority for reporting the pending reports is not necessary. |
| Huawei | No | When the RAN overload is solved, the UE can send all the pending QoE reports, and the NG-RAN can choose to resume these QoE reports of measurement with high priority. Then the UE will only re-start to send these pending reports with high priorities |
| Samsung | No | See above comments |
| China Unicom | No | It is no need to send the priority to UE, and UE will comply with the configuration from gNB (pause/resume indication with QoE reference (s)). |

### Whether a temporary stop and restart of QoE reporting should be indicated to MCE/OAM if such indication was sent to UE

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | Check with SA5 | SA5 specification TS 28.404 indicates that the RAN node can send an indication about the temporary stop and restart to the OAM when it sends the request towards the UE(s). This indication could be used by the NG-RAN to inform OAM about the QMC status e.g., whether QMC is paused. Send LS to SA5 to check. |
| ZTE | Probably no | We don’t see much necessity of sending the indicator to MCE/OAM. The requirement of SA5 is not clear, RAN3 do not need to consider it at this stage. |
| Huawei | No | We think stop/restart is RAN side business, not sure what OAM could if indicated to OAM. |
| Samsung | Check with SA5 | There’s no harm to check, if SA5 wants this indication. |
| China Unicom | Yes | RAN should inform OAM about the pause status to let it know which configured QoE reports have been stopped, and avoiding new QoE configuration from OAM until the overload situation eliminate. |

### Whether a temporary stop and restart of QoE reporting is applicable to other scenarios in addition to RAN overload

Moderator’s Note: moderator’s understanding is that if the answer is Yes to above question 3.4.3, company could share further comments to this question.

|  |  |  |
| --- | --- | --- |
| Company | Yes/No | Comment |
| Qualcomm | No | Don’t think so (at least SA5 specs don’t have any other scenario). Also, not sure why this question has to be related with question in 3.4.3. |
| Huawei | No | Before discussing this issue, we may need to understand what other scenarios are, after that, we could discuss if there is a need to check with other group if a consensus is reached. |
| Samsung | Not sure | Is there any different if the mechanism can be applied to other scenarios?  We already have the pausing mechanism, indeed, it’s used to solve the overload issue. But it’s hard to say whether it can be used for other scenarios in the future. If it can be used for other scenarios in the future, why not reuse it? |
| China Unicom | No | Temporary stop and restart of QoE reporting is designed for RAN overload, we can discuss whether there are other scenarios. |
|  |  |  |

## Other miscellaneous

Moderator’s note: Anything missing, companies are invited to list below.

### Issue 1

### Issue 2

# Conclusion, Recommendations [if needed]

If needed

# References

1. R3-214716, Reply LS on the mapping between service types and slice at application (SA4)
2. R3-214704, Reply LS on the mapping between service types and slice at application (SA2)
3. R3-214980, [DRAFT] Reply LS on Mapping Between Service Types and Slice at Application (Ericsson)
4. R3-214694, QoE Reference and maximum number of QoE configurations in RRC (RAN2)
5. R3-215790, Reply LS on QoE Reference and maximum number of QoE configurations in RRC
6. R3-214979, [DRAFT] LS Reply on QoE Reference and Maximum Number of QoE Configurations in RRC (Ericsson)
7. R3-214727, (TP for QoE BL CR for TS 38.413) QoE Configuration and Reporting (Ericsson)
8. R3-214908, QoE configuration details (Qualcomm Incorporated)
9. R3-215704, Clarification for QoE modification and overriding (China Unicom)
10. R3-214909, Per slice QoE (Qualcomm Incorporated)
11. R3-215021, Distribution of QMC Job Attributes for Management Based QoE (Ericsson, CMCC, China Unicom)
12. R3-215116, Introduction of NR QoE measurements on Xn interface (CATT)
13. R3-215117, Discussion on NR QoE configuration details (CATT)
14. R3-215310, Stage 3 updates following replies from other WGs (Nokia, Nokia Shanghai Bell)
15. R3-215544, NR QoE Configuration Details (Samsung)
16. R3-215633, Discussion on NR QoE Configuration (ZTE, China Telecom, China Unicom)
17. R3-215635, (TP for BL CR of TS 38.413) NR QoE Configuration (ZTE, China Telecom)
18. R3-215637, (TP for BL CR of TS 38.423) NR QoE Configuration (ZTE, China Telecom)
19. R3-215658, TP to 38.413 on configuration details (Huawei)
20. R3-215689, Remaining open issues on per-slice QoE measurement (CMCC)
21. R3-215706, Per-slice QoE measurement configuration and reporting (China Unicom)
22. R3-215708, QoE Configuration and Reporting (China Unicom)
23. R3-215657, Further discussions on configuration details (Huawei)
24. R3-215663, Stage 2 TPs to 38.300 on RAN related measurements and information (Huawei)
25. R3-214471, Reply LS on QoE configuration and reporting related issues, RAN3
26. R3-214721, Reply LS on QoE configuration and reporting related issues (SA5)