**3GPP T****SG-RAN WG3 Meeting #110-e R3-206896**

**Electronic Meeting, Nov 2nd – 12th, 2020**

**Agenda item: 15.2**

**Source: Qualcomm Incorporated - Moderator**

**Title:** **Summary of Offline Discussion for CB: # NRQoE2-RANawareness**

**Document for: Discussion and Decision**

# 1 Introduction

**CB: # NRQoE2-RANawareness**

**- Take LTE as the baseline, the QoE configuration and QoE measurement results defined by SA4 should be delivered as a container? Or QoE reports should be visible for RAN in conditions?**

**- RAN awareness of QoE as optimization can be achieved by the following solutions ?**

1. **gNB directly understand UE QoE report up to implementation**
2. **UE reports generic QoE score to gNB**
3. **MCE report generic QoE score to gNB**
4. **gNB derives QoE score by ML model**
5. **UE provide the report data as two parts, one for RAN with RAN designed format, and one for TCE server**
6. **RAN-visible QoE metrics in NR QoE which are duplicated or deduced from that encapsulated in the transparent container**

**- Capture agreements as TP for TR**

(QC - moderator)

Summary of offline disc [R3-206896](Inbox%5CR3-206896.zip)

# 2 For the Chairman’s Notes

TBD

# 3 Discussion

In LTE QoE measurement, the configuration and measurement results are delivered as container defined by SA4. RAN forwards the containers between UE and QMC/MCE transparently.

### **Question 1: Shall we take LTE QoE solution as baseline, i.e. the QoE configuration and QoE measurement results defined by SA4 are delivered as container?**

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| **Company** | **Yes/No** | **Comments** |
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RAN aware of QoE may enable some close loop optimizations by RAN. The exact optimization solutions can be up to implementation, e.g. QoE aware scheduling, QoE aware resource allocation, QoE aware traffic steering, QoE aware load balancing.

### **Question 2: Do you see any benefit for RAN to understand some QoE metrics?**

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| **Company** | **Yes/No** | **Comments** |
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RAN awareness of QoE as optimization can be achieved by the following solutions.

1. gNB directly understand UE QoE report up to implementation, no standard impact
2. UE reports generic QoE score to gNB
3. MCE report generic QoE score to gNB
4. gNB derives QoE score by ML model
5. UE provide the report data as two parts, one for RAN with RAN designed format, and one for MCE server
6. RAN-visible QoE metrics in NR QoE which are duplicated or deduced from that encapsulated in the transparent container

**Question 3: If answer to question 2 is yes, which kind of QoE aware by RAN do you prefer?**

* **Type 1: gNB directly understand UE QoE report up to implementation, i.e. option a) and d) above**
* **Type 2: gNB receives RAN-visible QoE metrics from UE, i.e. option b) and e) above**
* **Type 3: gNB receives RAN-visible QoE metrics from MCE, i.e. option c) above**

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| **Company** | **Type** | **Comments** |
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Type 1 is outside the scope of this study item. Type 3 is outside the scope of RAN3, but RAN3 can propose SA4/SA5 to define it by LS.

**Question 4: If type 2 is preferred in question 3, which kind of RAN-visible QoE metrics do you prefer? Please give some examples.**

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| **Company** | **Answer** |
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The RAN-visible QoE metrics should be generated from SA4 defined QoE measurement result container.

**Question 5: Do you agree the RAN-visible QoE metrics should be derived from SA4 defined** **QoE measurement result container and send LS to SA4 to confirm the feasibility?**

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| **Company** | **Yes/No** | **Comments** |
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**Question 6: Do you agree to capture attached TP into the TR? Any changes are needed for the TP?**

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| **Company** | **Yes/No** | **Comments** |
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# 4 Conclusion

TBD

# 5. Appendix: Technical Proposal

# 6 Potential NR QoE solutions and procedures

Editor note: Description of potential NR QoE solutions and procedures, including but not limited to reuse Trace or MDT Functionality/Framework.

## 6.x Generic QoE score reporting by UE

QoE aware by gNB enables close loop QoE optimization by RAN. It is too complicated for gNB to understand the real QoE metrics. A generic QoE score can be derived from QoE metrics by UE. gNB uses the generic QoE score for close loop QoE optimization. Figure 6.x-1 shows the message flow for generic QoE reporting.



Figure 6.x-1: Generic QoE reporting

1. QoE server configures QoE measurement and reporting condition by QoE configuration container
2. RAN decides to collect generic QoE score. gNB configures UE to measure QoE per QoE configuration container and report generic QoE score per generic QoE configuration. gNB configures separate reporting cycle and condition for generic QoE score so that it can get QoE score timely.
3. UE measures QoE and derives generic QoE score. UE reports the QoE report per QoE server configured reporting condition and report generic QoE score per gNB configured reporting condition.
4. gNB forwards reported QoE report container to QoE server.

# 6 Reference

1. R3-206036, Discussion on NR QoE solutions (Samsung) discussion
2. R3-206360, Discussion on NR QoE solutions (CATT) discussion
3. R3-206361, Discussion on RAN involved NR QoE (CATT) discussion
4. R3-206369, Open points on QMC framework (Nokia, Nokia Shanghai Bell) discussion
5. R3-206397, pCR for TR 38.890 Radio-related Measurements and Information in NR QoE Management (Ericsson) pCRr, TS 38.890 v0.1.0, Rel-17, Cat.
6. R3-206492, Further discussion on NR QoE solution (China Unicom) discussion
7. R3-206713, Further Consideration On Study of NR QoE (ZTE) discussion
8. R3-206732, Discussion of QoE report visibility at RAN (Huawei)
9. R3-206733, Discussions on the radio related measurements and information as assistance to the NR QoE management functionality (Huawei, China Unicom, China Mobile) pCRr, TS 38.890 v0.1.0, Rel-17, Cat.
10. R3-206734, Discussions on potential RAN3 impacts about the QoE measurement configuration, reporting and releasing under SA, NSA and MR-DC operation (Huawei, China Unicom) pCRr, TS 38.890 v0.1.0, Rel-17, Cat.
11. R3-206787, Further discussion on NR QoE management (CMCC) discussion