3GPP TSG-RAN WG3 #111-e R3-21xxxx

25 January – 4 February 2021

Online

**Agenda Item: 15.2**

**Source: Huawei - Moderator**

**Title:** **Summary of Offline Discussion on RAN Configuration and Reporting of QoE measurement**

**Document for: Approval**

# **Introduction**

**CB: # NRQoE3-RANConfig\_Report**

**- QoE support for new services, SA4 LS in R3-210041? Support non-3GPP standardized application? Support Time Sensitive Communication and liaise SA4?**

**- Support Management-based QoE solution where a UE identifier is optionally included in the QoE measurement configuration, to enable collecting QoE reports from an individual UE? Yes, E///. No. Nokia.**

**- Signalling for Management-based and Signalling-based QoE supports multiple QoE measurements for different service types for the same UE? Whether and how to deactivate one of the multiple QoE measurements? Need check by RAN?**

**- There is no need to introduce RAN autonomously triggered QoE measurement mechanism?**

**- Radio related assistance measurements used for QoE management are only meaningful when there is at least one on-going QoE recording session?**

**- QoE handling at RAN overload? QoE report suspending in RAN overload and RRC\_IDLE/INACTIVE? Reply to SA4 LS in R3-210042**

**- Can RAN and/or OAM start/stop/pause/resume measurement collection at the UE? Independently or as per triggering conditions? For both legacy and RAN-visible QoE?**

**- Can RAN and/or OAM start/stop/pause/resume measurement reporting from the UE? Independently or as per triggering conditions? For both legacy and RAN-visible QoE?**

**- How to align radio measurements and QoE reports?**

**- Capture agreements as TP for TR**

**(HW - moderator)**

Summary of offline disc R3-211013

# **For the Chairman’s Notes**

Propose to capture the following:

**To be continued**

# **Discussion**

Since this should be the last time for this SI, it seems that there are still many open issues, but some of them are pure stage 3 details, here moderator tried to, according to the guidance of this CB from chair, directly extract proposals from contributions and reformate to issues.

**Issue 1: Support for new service, e.g. XR, URLLC, also including non-3GPP standardized application and TSC**

Moderator’s note: we see some discussions in [6] [9] [10], also we see reply LS from SA4 in [1], we may need some consensus, e.g. to work on something which is also being discussed in SA4. Companies are invited to provide view for each service type mentioned here.

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| Company | Comment |
| Huawei | In general, RAN3 should work on the service type(s) which is also being discussed in SA4. Based on this understanding, we think:   * XR could be introduced * URLLC is a general description of a service category, we need to see which exact service type we are discussing; * No need to discuss non-3GPP standardized application now, we could start this from SA4. * No need to discuss TSC now, since TSC as a service type is knows by RAN via QoS parameter, and SA4 has not discussed TSC yet. |
| Samsung | As the objective of the SI is to support NR QoE for diverse services, we think it’s good to think about supporting non 3GPP service types, which may be customized by providers or operators, and may not be defined by SA4.  But in our view the solution in [6] is not a complete solution, and it’s also too early to discuss the details.  So we think we can consider to support all the service types needed by operators including SA4 defined or undefined service types, but details are FFS. |
| Nokia | Handling of particular aspects for specific service types seem premature - the study currently focuses on the general framework. |
| Qualcomm | XR can be introduced (SA4 already sent LS confirming this).  Requirements for other service types mentioned such as URLLC (not clear at this time), non-3GPP, TSC should come from SA4. And we can always extend the supported service types once the framework is ready. |
| ZTE | XR could be introduced as a new service type.  The others e.g. non-3GPP seem to early to be introduced in Rel-17. |
| CMCC | Similar view as QC. We can start from service types provided by SA4, and extend at any time if needed. |
| CATT | Agree with QC and CMCC, we can add any new support service from SA4 also from other group. The service type is extendable. |
| China Unicom | Agree with Huawei.  XR should be added as one of the service types supported by NR QoE and the FFS about URLLC related service types in the TR can be removed. The new service from SA4 could be added if the service type is extendable. |
| **Ericsson** | We think that all these service types (XR, URLLC, also including non-3GPP standardized application and TSC) should be supported. The arguments from the opponents are mainly concerned with the jurisdiction of SA4 for such a discussion.  We agree that the application support is the scope of SA4, but RAN3 can still state their view e.g. in an **LS to SA4, which SA4 can consider in their work**. So, **we propose to focus the discussion on technical aspects/reasons to support or not, rather than formal aspects.** |
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**Issue 2: Whether to support RAN autonomously triggered QoE measurement**

Moderator’s note: we see some discussions in [9] [11] about RAN autonomously triggered QoE measurement. Please companies provide your view (yes/no) and comments if any.

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| Company | View | Comments |
| Samsung | Yes | In our view, RAN can trigger RAN visible QoE measurement configuration on demand, this is also discussed in CB RAN visible QoE. |
| Huawei | No | As explained in our paper, we think QoE measurement is an E2E measurement, not sure what could RAN get if triggered by RAN, in addition to RAN initiated MDT related measurements… |
| Nokia | No | Agree with HW. However if a use case can be defined where the RAN becomes the end consumer of a measurement done by the application layer, the framework should be extendable to cover such case. |
| Qualcomm | No | No need for RAN autonomously triggered QoE measurements for legacy QoE.  Even if we support RAN visible QoE, we think RAN can’t autonomously trigger QoE measurements and can only control RAN visible QoE reporting interval if at all (UE APP will compute RAN visible QoE metrics and send it to UE AS which in turn will report to RAN on a periodic/event trigger (FFS) set by RAN).  Can be discussed further in CB RAN visible QoE |
| ZTE | No | There is no need to add the function of RAN triggered QoE measurement, which just makes the QoE measurement procedures more complicated. |
| CMCC | Yes | This question is dependent on the outcome of another CB.  In our opinion, if some RAN visible QoE metrics/parameters are agreed to be introduced, RAN can be provided with the ability to autonomously trigger QoE configuration to those RAN visible QoE metrics/parameters for RAN optimization. |
| CATT | Yes | Similar view as CMCC. RAN may trigger the RAN visible measurement  RAN should have the full control for the RAN visible measurement. Include configure, release the configuration, the trigger may event trigger, periodic, one-time.  So we may get more clear understanding on what is “the RAN autonomously triggered QoE measurement” |
| China Unicom | No | RAN is not supposed to autonomously trigger the QoE measurement. |
| **Ericsson** |  | For **legacy QoE measurements**:   * OAM signals to RAN the conditions to start, stop, pause or resume QoE measurements; * RAN cannot alter the received QoE configuration; * RAN can reconfigure UEs with the received QoE configuration by means of *RRCReconfiguration* to start, stop, pause or resume QoE measurements according to the QoE configuration received from OAM; * RAN can reconfigure UEs to stop, pause or resume QoE measurement configuration independently of OAM; * OAM can signal RAN to suspend ongoing QoE reporting; RAN can suspend QoE reporting from UE.   For **RAN-visible QoE measurements**:   * RAN can start, stop, pause or resume QoE measurement configuration; * RAN can suspend QoE reporting from the UE. |

**Issue 3: Whether a UE identifier is optionally included in the management based QoE measurement configuration**

Moderator’s note: we see some discussions in [6] [8] about optionally including a UE identifier in the management based QoE measurement configuration, in order to enable collecting QoE reports from an individual UE. Please companies provide your view (yes/no) and comments if any.

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| Company | View | Comments |
| Samsung | Tend to No | For M-based QoE, it is gNB choose the UEs according to their capabilities for the given service type.  In [6], it is said that OAM can choose the UE among UE identifiers provided by gNB, we don’t see the benefits that UE is selected by OAM instead of gNB, and as there are transmission delay btw OAM and gNB, there could be a situation that the UE selected by the OAM is not served by the given gNB anymore when the configuration is sent from OAM. |
| Huawei | Maybe not | Not sure the real intention, the intention of management is for OAM to give guidance/requirements for the RAN to select a specific UE, so what’s the point that OAM to select a UE directly without using signaling based one. |
| Nokia | No | If the OAM needs to activate QoE reporting for a specific UE, it should use s-based activation. |
| Qualcomm | No | Same view as Nokia |
| ZTE | No | The UE identifier would not work. Even if the OAM gets the UE identifier from RAN node and use it to configure QoE measurement for an individual UE. Without the user consent from UE, OAM could not be able to get the measurement from an individual UE. In general, the user consent could only be obtained by the core network. |
| CMCC | No | We’ve agreed to introduce s-based QoE configuration and s-based is enough. |
| CATT | No | Agree above |
| China Unicom |  | The purpose to support management based QoE towards an individual UE should be clarified. |
| **Ericsson** |  | Our understanding of the main use cases is the following:  For **s-based activation** the operator’s staff (e.g. customer care) receive a request to perform a QoE measurement campaign to monitor the QoE for a specific person. So, **the s-based** measurement starts if a **user notices performance degradation and asks the operator to monitor.**  But **what if the operator wants to observe the QoE in a certain area?** Users in that area are configured without any information sent to the final user. In this case the steps are as follows:   1. Operator wants to observe the QoE in a certain area 2. Therefore, operator configures m-based measurements in an area 3. Based on the measurements, operator realizes that in a certain area there is a problem and wants to see which UEs are experiencing the problem.   In this case, **to be able to detect where the problem is, the m-based framework needs to be able to target a specific UE, because there is no active involvement from user side to request s-based activation.**  Now, as OAM is unaware of the identities of the UEs in the area, OAM asks gNBs to provide OAM with a list of UE identifiers. Such UE identifiers are not the permanent UE identifiers, but rather UE identifiers only known within the RAN. Once retrieved, OAM can start QoE measurements towards the corresponding UEs. The received QoE reports will be used to judge if the performance degradation initially detected can be solved by means of per-user policy. An example of such UE identifier is the RAN UE ID specified for F1AP. |

**Issue 4: Supports for multiple QoE measurements for the same UE? Whether and how to deactivate one of them? Need check by RAN2?**

Moderator’s note: we see some discussions in [5] [6] [8] about supporting for multiple QoE measurements for the same UE for both signaling based and management based, whether and how to deactivate one of them, whether to need check by RAN2. Please companies provide your view (yes/no) and comments if any.

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| **Company** | **View** | **Comments** |
| Samsung | Yes | For S-based QoE, the QoE activation or deactivation is transmitted from CN, which means NG interface will be impact first, so support (de)activate multiple QoE measurement should be decided by RAN3 first.  For M-based QoE, need check by RAN2.  Regarding how to support, for activation, a list of QoE measurement configurations should be included in the activation message. For deactivation, a list of QoE references should be included in the deactivation message. |
| Huawei | Yes | Since there might be more than one service ongoing for a UE, it is natural to support multiple service of QoE measurement for the same time. For detailed mechanisms, it is mainly up to RAN2 to design. |
| Nokia | supportive | This seems useful. However it will be heavily UE impacting so needs confirmation by RAN2. |
| Qualcomm | Yes | This is SA5 requirement. RAN2 might define a UE capability whether UE supports multiple QoE configuration and reporting and also the signaling for the activation/deactivation over RRC (we can wait for RAN2 agreements).  In RAN3, we should introduce signaling over Xn and NG for sending a list of QoE configurations (to support multiple QoE) at the same time and an option to deactivate a subset/all of the configured QoE by providing the QoE-referenceID.  We can send an LS to SA5 (and cc RAN2) that RAN3 can support multiple QoE in normative phase and capture this in the TR. |
| ZTE | Yes | The requirement come from SA5, and the impact to RAN3 part , e.g. introduce a list of QoE measurement configuration IE is feasible. |
| CMCC | Yes | Similar view as QC. |
| CATT | Yes | Agree with QC |
| China Unicom | Yes | Configuration for multiple simultaneous QoE measurements for a UE shall be supported. |
| **Ericsson** | Yes | Please note that this is an SA5 requirement, so **RAN3 should go ahead and agree to support this on NG and Xn**, and then ask RAN2 to provide RRC signalling support. |

**Issue 5: QoE handling at RAN overload**

Moderator’s note: we see some discussions in [6] about how QoE measurement is handled at RAN overload scenario, the proposals could be summarized as follows:

For SA operation or EN-DC/NR-DC when both nodes are overloaded, RAN is allowed to

* Not to trigger new QoE measurement if requested
* Release/suspend ongoing QoE measurement, fulfilling SA4 and RAN2 agreements
* Suspend QoE reporting

For EN-DC/NR-DC when only one node is overloaded, RAN is allowed to

* QoE measurement is reported towards the non-overloaded RAN node, with reconfigured MCG/SCG SRB bearer
* previous overloaded node may request the QoE report from the other node when overload is solved, if analysis justify

Please companies provide your comments on each of the proposals above..

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| Company | Comments |
| Samsung | For SA case, we prefer suspend or prolong QoE reporting which can keep the integrity of the QoE report even RAN overload. It means the QoE measurement is continue in UE application layer, cache QoE report will be performed. In our view, whoever (App layer or AS layer) implement this needs extra caching space, and it’s out of RAN3 scope. since SA4 is not in favor of caching QoE reports in application layer [R3-210042], so we need further check with RAN2 whether caching QoE reports in AS layer is feasible.  For NSA case, we think the suspend and prolong QoE reporting can also be used. At this stage, we still not sure which SRB will be used for QoE report, whether the QoE report can be forwarded to SN, should be decided by RAN2. |
| Huawei | In general, we support to introduce some mechanisms for RAN to handle QoE measurement in case of overload, but detailed solutions should be up to RAN2 to design, since anyway it is mainly related with AS layer behavior, especially that SA4 expressed their unwillingness to do this in application layer. |
| Nokia | Should be done in the AS layer. Probably the UE should simply discard measurements that could not be conveyed due to RAN overload, hence avoiding new overload situation in the network when the reporting resumes. |
| Qualcomm | First of all, we think we can deprioritize all MR-DC scenarios for QoE in Rel-17.  For SA, we agree RAN should introduce mechanisms to handle overload scenarios (RAN2 should handle RRC signaling for the same and whether UE AS will support caching QoE report or will discard them upon receiving from UE APP on RAN overload).  Considering this is an important decision for supporting RAN overload (and also QoE for RRC\_IDLE/RRC\_INACTIVE) and involves multiple WGs, we have prepared an LS in R3-210356 to ask SA4 (we can cc RAN2) if they can consider caching at UE APP layer based on our discussion paper in R3-210355.  Also prolonging QoE report interval as highlighted by Samsung is not preferred by us as this will involve both SA4 (communicating this new interval to APP layer) and RAN2 (caching reports at UE AS) |
| ZTE | RAN overload is one of the main issues in RAN2. Better to wait RAN2 ‘s progress. |
| CMCC | Agree the some mechanisms are needed to deal with overload conditions. And details can be discussed during WI phase.  Regarding the LS from SA4, we also acknowledge the potential need for caching at UE AS, which needs to be decided by RAN2. |
| CATT | RAN2 can be responsible for this issues. |
| China Unicom | Ok with two proposals. |
| **Ericsson** | Agree to both proposals. Not only that **MR-DC scenario is of high interest for the QoE**, it is also that **we should be able to use the merits of MR-DC** (i.e. the fact that we have two legs) in order to **keep the reporting to proceed even if one leg is overloaded**.  As per Huawei comment that “*detailed solutions should be up to RAN2 to design*”, please note that there is certainly RAN3 signaling impact in the MR-DC case, and RAN3 hence shares the mandate with RAN2 over this issue. So, in addition to the proposals above, we also propose to capture the following:  **Proposal: RAN3 inter-node signalling impact in connection with QoE report handling during and after RAN overload is possible.** |

**Issue 6: Handling for QoE collection and QoE reporting**

Moderator’s note: we see some discussions in [6] [7] about Handling for QoE collection and QoE reporting. The issues could be summarized as follows:

For both reporting and collection:

* Can RAN and/or OAM stop/re-start, pause/resume the operation at the UE? Are there any conditions for triggering such operation?
* Is such operation applicable to both legacy and RAN-visible QoE?

Please companies provide your view (yes/no) and comments if any.

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| Company | Comments |
| Samsung | * For handling of QoE configuration   We observe that companies had different understandings on words such as start, stop, activate and deactivate. So we suggest clarify those words in the TR and follow the same principle in LTE.  As in LTE QMC, there are only two words related to QoE configuration in TS36.300, which are “setup” and “release”, according to TS28.405, the **activation** means RAN **setup** configuration, **deactivation** means RAN **release** the configuration.  In 36.300, it is said that “ E-UTRAN can **release** the application layer measurement **configuration** towards the UE at any time.” For NR QoE, which is based on LTE QoE, should also follow the same principle that RAN can **release** the application layer measurement **configuration**. But this doesn’t mean the QoE measurement will be stopped immediately in application layer, as in SA4, it is said that UE only checks the configuration when each session starts. The release operation will only affect session from the next session, not the on-going session.  So in our view, RAN can **release (i.e. stop QoE measurement from the next session) /setup** **(i.e. start QoE measurement from the next session)** the **QoE configuration** for a UE according to its own purpose (e.g. RAN overload), it’s the same as LTE.   * For handling of QoE reporting.   It’s kind of enhancement based on LTE QMC, as in LTE, RAN is not aware of QoE reporting configuration, in NR QoE, we think if RAN can configure QoE reporting in AS layer without impact the original report generation in application layer, it would be beneficial when RAN overload, of course this topic is discussed in issue 5.  So in our view, to support QoE reporting suspending when RAN overload, RAN can suspend or prolong the QoE reporting in AS layer.  And we think above operations in RAN are applicable to both legacy and RAN-visible QoE. |
| Huawei | For handling of QoE configuration, similar view as SS, just to simply stop/re-start or just release (which means this task is terminated)  For handling of QoE reporting, we think RAN is allowed to suspend or delay the reporting, but detailed mechanism is up to RAN2 to design.  We also think that above behavior applies to both legacy and RAN-visible QoE. |
| Nokia | We believe that the legacy LTE QMC specification in the RAN addressed AS layer and application layer simultaneously. So "release" also meant release of currently ongoing reporting. |
| Qualcomm | For handling of QoE configuration, same view as Samsung (RAN can setup or release the QoE configuration as needed)  For handling of QoE reporting, RAN is allowed to suspend the QoE reporting (whether it is suspended at UE AS or UE APP is discussed in issue 5).  We don’t prefer RAN to delay QoE reporting due to reasons mentioned in issue 5.  And we think this can be applicable to both legacy and RAN-visible QoE. |
| ZTE | We think when receive release command, the QoE measurement will be stopped immediately in application layer.  As seen from 28.405, OAM can directly stop an on going session which has start QoE measurement in Application layer.:  “ For UE request sessions which have reported that a recording session is started, the eNB sends the RRCConnectionReconfiguration message [8] to relevant UEs. The RRCConnectionReconfiguration message is including *measConfigAppLayer* set to discardapplication layer measurement report information in *otherConfig* [8]. The Access stratum sends +CAPPLEVMC AT command [5] to the application with the discard request. The application stops the recording session and stops recording of the requested information.”  While check SA4’s requirement for continue QoE measurement , our understanding is this is apply to “out of scope” case, not apply to Application layer when receive “release command” .  LS in ***S5-197543:***  “SA4 issue 5:  **Within-Area Indication** is specified to be sent by the RAN to the UE and then to the application when a handover is made. If the indication states that the UE is outside the wanted measurement area, QoE reporting for ongoing sessions may continue until these sessions end, but no new QoE sessions shall be started. SA4 tentatively agrees to implement this, but notes that it requires supporting functionality from CT1.  SA5 answer: The observation that supporting functionality from CT1 is needed is correct. Also supporting functionality is needed from RAN2 and RAN3.  ”  Conclusion :  For OAM:  To my understanding, OAM can activation/start and deactivation/stop the QoE measurement in Application layer.  No evident show OAM can suspend /resume QoE measurement in Application layer. May consult SA5.  For RAN:  RAN can Deactivate/stop the QoE measurement in Application layer.  One possible scenario for RAN to do so is when RAN does not able to continue QoE measurement. For example in case of M-based QoE, when UE will handover to other NG-RAN node. In this case, as one of the solutions, RAN can send release message to UE AS layer, and UE AS layer AT command to stop on-going recording session.  For RAN visible QoE mechanism:  The mechanism is different from QMC triggered by OAM.  If the mechanism approved in R17, we see the benefit for RAN to stop/re-start, pause/resume the operation at the UE application layer.  For reporting :  Depends on RAN2 progress. |
| CMCC | In our opinion, RAN is able to temporary stop and restart QoE reporting during RAN overload, reusing LTE as the baseline. Such operation can be applicable to both legacy and RAN visible QoE. |
| CATT | RAN may suspend /resume the QoE report for both legacy and ARN visible QoE. It depends RAN2 decision. For OAM , we need consult the SA5 |
| China Unicom | RAN can configure UEs to stop and restart QoE measurements from OAM/CN for both legacy and RAN-visible QoE. |
| **Ericsson** | This is related to Issue 2. We think that the following should hold:  For **QoE measurements not visible to RAN:**   * OAM signals to RAN the conditions to start, stop, pause or resume QoE measurements; * RAN cannot alter the received QoE configuration; * RAN can reconfigure UEs with the received QoE configuration by means of *RRCReconfiguration* to start, stop, pause or resume QoE measurements according to the QoE configuration received from OAM; * RAN can reconfigure UEs to stop, pause or resume QoE measurement configuration independently of OAM; * OAM can signal RAN to suspend ongoing QoE reporting; RAN can suspend QoE reporting from UE.   **For RAN-visible QoE:**   * RAN can start, stop, pause or resume QoE measurement configuration; * RAN can suspend QoE reporting from the UE. |

**Issue 7: Handling for QoE measurement and its corresponding radio assisted measurement**

Moderator’s note: we see some discussions in [12] [13] about handling for QoE measurement and its corresponding radio assisted measurement. The issues could be summarized as follows:

* If QoE measurement is stopped/released, this corresponding radio related assistance measurements should also be stopped/released. According to the indication from UE application layer?
* Bearer information (e.g. DRB list or QoS flow ID) related to the QoE measurement should be indicated to the gNB or QoE server for Correlation.
* the collection of the radio related assistance information should include all the serving gNBs that the UE went through during the corresponding time of one QoE report.
* the radio related assistance information should be provided along with the QoE report by UE, inside or outside of the QoE report container is FFS

Please companies provide your view and comments for each proposal above, if any.

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| Company | Comments |
| Samsung | Yes, to all proposals.   * For radio related measurements     The radio related measurements which are used to assist QoE analysis should only be started/stopped when the corresponding QoE measurement is start/end. And when QoE measurement starts/stops is the UE individual behavior, so the application layer should indicate it to the gNB and/or UE AS layer.  Moreover, considering multiple recording sessions and multiple QoE measurements may appear at the same time, additional information such as QoE reference and recording session ID should be included in the indication for further correlation.  In addition, if radio related measurement is to measure DRB, the DRB information should also be indicated to gNB or QoE server for correlation.   * For radio related information   One QoE report may relate to the information from multiple gNBs that serve the UE during the collection time of the QoE report, so the radio related assistance information should include all the serving gNBs    It would be easier and will have less impact if this information is collected from UE along with the QoE report instead of collecting from multiple serving gNBs. |
| Huawei | Not sure if we should go into details of each proposal, but in general, we think it is better that QoE measurement and its corresponding radio assisted measurement should be configured together and reported together. And the operation of suspending or releasing should also be applied to both. |
| Nokia | agree with Huawei |
| Qualcomm | All the proposals mentioned involve adding new “radio related information” such as session start/stop indication, bearer ID, serving gNB etc.. which are not agreed and we don’t prefer to include to not overcomplicate NR QoE.  “Radio related measurements” can simply be the existing MDT reports. We can enable time alignment between MDT reports and QoE measurement, e.g. by using QoE reference ID to bind the MDT measurements to the QoE measurements which can be used by MCE for correlation purposes. |
| ZTE | Agree with Huawei and Nokia. |
| CMCC | Agree with HW. |
| CATT | In this topic, may I understand as that how the legacy QoE measurement report work together the existing radio related information collection(such as MDT) So what the relation between the RAN visible QoE and radio related information? |
| China Unicom | Agree with HW. |
| Samsung2 | That’s fine we are not going to details, the proposals here are related to the chapter “6.8 Radio-related measurements and information for QoE” in TR 38890, we are trying to make this radio related measurements and information workable for QoE analysis. And we also agree with HW that they should be aligned, e.g. configure together or report together. So we have below text proposal for chapter 6.8:  “The NG-RAN can configure QoE measurement and radio related measurement together and report together for better correlation”  “The radio related information can be reported together with QoE report” |
| **Ericsson** | Samsung2 proposal (just above this comment) is OK, and we want to add an additional statement to 6.8:  “*The QoE measurements, RAN-visible measurements and radio-related measurements are time-aligned, meaning that measurement execution at the UE should be activated, triggered, deactivated, suspended and resumed simultaneously. At RAN overload, the reporting of RAN-visible QoE may continue even if the reporting of QoE measurements has been temporarily suspended.”* |

**Issue 8: General rules for MR-DC**

Moderator’s note: we see some discussions in [9] about some general rules for MR DC operation when triggering QoE measurement. The issues could be summarized as follows:

* For MR-DC operation including NSA, only one node is allowed to configure the QoE measurement, and the MN could decide which node to configure the QoE measurement for a certain service type.
* For a gNB acting as SN, it could configure the QoE measurement directly towards that UE over SN leg.

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| Company | Comments |
| Huawei | Yes.  We think the proposals should be agreed as general principle for handling MR-DC case. |
| Nokia | This depends on RAN2 decision. |
| Qualcomm | Deprioritize MR-DC in Rel-17 |
| zte | Share the view with Qualcomm. |
| CMCC | Up to RAN2 to decide. |
| CATT | Up to RAN2 |
| China Unicom | Agree with general principle for handling MR-DC case and this is related with RAN2 discussion. |
| **Ericsson** | We think that for now it is agreeable that, **for a given service**, only one node is allowed to configure the measurement. Details can be discussed later. |

**Other issues:**

* Issue 9: NG-RAN can receive a QoE configuration including a request, visible to RAN, for aligning radio measurements and QoE reports. Two options for RAN3 discussion and agreement: (1) Immediate MDT configuration extended with reference to QoE measurements, MDT measurements started at session start; (2) QoE measurement configured first, RAN triggers MDT upon indication from UE of session start.
* Issue 10: RAN3 sends an LS to RAN2 to discuss support over RRC for:
  + A list of QoE measurement configurations;
  + Starting, stopping, pausing, resuming QoE measurement configuration;
  + Suspending QoE measurement reporting;
  + Releasing ongoing QoE measurement configurations;
  + Reconfiguration of SRB for QoE reporting;
  + Alignment between radio measurements and QoE reports based on MDT framework;
  + Indication of slicing identity in QoE measurement configuration and QoE reporting.

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| Company | Comments |
| Huawei | For first bullet:   * We could consider an indication from e.g. OAM requiring RAN assisted info; but this is stage 3 details I suppose; * Our understanding, the common understanding is to take MDT as base line for triggering RAN assisted measurement, then it is up to RAN2’s design;   For second bullet: in general, we think they are mainly RAN2 related scope, and RAN2 is working on this, thus we just wait for RAN2’s input. |
| Nokia | First bullet - "*RAN triggers MDT upon indication from UE of session start* ": Indeed, triggering MDT measurements before the session starts doesn't seem useful. On the other side the session start is transparent to the RAN, but could maybe be detected upon reception of the first QoE report.  Second bullet: We also believe that RAN2 works on this. Concerning measurement resumption as mentioned in our paper, we might also need to clarify with SA4 whether measurement reporting shall be resumed after the UE transitions to idle and then back to RRC connected. We propose this is supported for s-based QoE, but it is a bit strange that SA5 didn't capture such scenario in TS 28.405 and SA4 didn't provide any requirement. Maybe this scenario is of low priority for the targeted NR services. |
| Samsung2 | First bullet, if the MDT measurements is used to assist QoE, it should be time aligned with QoE measurements, otherwise it’s meaningless. Obviously RAN is not aware of the session start/end. As QoE report can be send periodically or at the end of the session, using QoE report to detect may not be a good choice.  So based on our analysis, there need to be a mechanism to align the MDT measurements with QoE measurements. For this purpose, we suggest using the descriptions in R3-210527 as a starting point. 6.3.6 Alignment of radio measurements and QoE reports NG-RAN can support alignment of radio related measurements and QoE reports by means of Immediate MDT configuration with reference to QoE measurements (e.g.: QoE reference ID) and starting the MDT measurements when session starts, or by configuring the QoE measurement first, and NG-RAN activate the MDT measurements upon indication from UE of session start and deactivate the MDT measurements upon indication from UE of session end. |
| **Ericsson** | We **agree to both proposals and the proposed text by Samsung2,** with one edit: 6.3.6 Alignment of radio measurements and QoE reports NG-RAN can support alignment of radio related measurements and QoE reports (including the RAN-visible reports) by means of Immediate MDT configuration with reference to QoE measurements (e.g.: QoE reference ID) and starting the MDT measurements when session starts, or by configuring the QoE measurement first, and NG-RAN activate the MDT measurements upon indication from UE of session start and deactivate the MDT measurements upon indication from UE of session end.  Regarding **Issue 9:** the time alignment of the radio- and application-layer measurements is essential for their joint use, so we think these potential options should be captured, as Samsung suggests.  Regarding **Issue 10,** I suppose we should inform RAN2 about our agreements that concern them, right? |
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# **Conclusion, Recommendations**

See section 2.

# **References**

1. R3-210041, LS Reply on New service type of NR QoE, (SA WG4)
2. R3-210042, LS reply on QoE Measurement Collection, (SA WG4)
3. R3-210355, QoE report suspending in RAN overload and RRC\_IDLE/INACTIVE, (Qualcomm Incorporated)
4. R3-210356, LS reply on QoE Measurement Collection, Qualcomm Incorporated
5. R3-210507, Open issues in NR QoE solutions, (Samsung)
6. R3-210527, pCR for TR 38.890: Handling of QoE Measurement and Reporting and Support for New Services, (Ericsson)
7. R3-210658, (TP for TR 38.890) QoE measurement collection continuity vs. reporting continuity, (Nokia, Nokia Shanghai Bell)
8. R3-210659, (TP for TR 38.890) QoE measurement configuration for specific UEs, (Nokia, Nokia Shanghai Bell)
9. R3-210820, Further discussions on the remaining open issues of QoE configuration and reporting, (Huawei)
10. R3-210848, Further consideration on NR QoE service and procedure, (ZTE)
11. R3-210772, Discussion on RAN visible QoE configuration and reporting, CATT
12. R3-210849, TP for TR 38890, (ZTE)
13. R3-210509, Discussion on radio related measurements and information in NR QoE, Samsung