3GPP TSG-RAN WG3 Meeting #113-e R3-214197

E-meeting, 16 – 26 August, 2021

**Agenda item: 15.2.2**

**Source: Nokia (moderator)**

**Title: CB: # QoE4\_Mobility - Summary of email discussion**

**Document for: Approval**

# 1 Introduction

This paper provides summary of discussions at RAN#113-e on:

**CB: # QoE4\_Mobility**

**- Whether signaling and management based QoE support mobility continuity?**

**- Introduce new IEs (e.g. indicate signalling/management based QoE, mark ongoing QoE measurement, indicate the pause status, etc) for QoE mobility?**

**-Whether/how to add the QoE configuration message or new IEs into the XnAP HANDOVER REQUEST, NGAP HANDOVER REQUIRED, NGAP HANDOVER REQUEST, and XnAP RETRIEVE UE CONTEXT RESPONSE?**

**- In the case when target gNB does not support QoE, RAN should release all QoE configuration? QoE reporting should be paused and the QoE configuration should be stored with limitation (e.g. a timer)? Target node should store the QoE configuration received from source node?**

**- Discuss the following aspects on overriding issue: Whether the overriding scenario exists for management based QoE and signalling based QoE? Postpone the discussion and waiting for other WGs (e.g. RAN2, SA4) input? A signalling based QoE configuration can override another management based QoE configuration? A signaling based QoE configuration can override another signaling based QoE configuration? A management based QoE configuration can override another management based QoE configuration?**

**- UE should keep performing the signalling/management based QoE measurement when UE is out of the area scope? Check with RAN2?**

**- Capture agreements and open issues**

(Nok - moderator)

For first round of the discussion it is proposed to handle the above discussion points that are in relation with open points captured at previous meeting:

**Whether a management based QoE configuration can be released before handover or if it must be propagated to target node to fulfil SA4 requirement on QoE measurement continuity; pending SA5 reply LS on support for management-based QoE and SA4 reply LS on ongoing session continuity requirement.**

**Whether a QoE Measurement Type indicator is included in QoE configuration and signaled to target node during Handover preparation and Retrieve UE Context Procedures**

**Whether a management based QoE configuration can override another management based QoE configuration and whether a signaling based QoE configuration can override another signaling based QoE configuration.**

**Upon reception of a non-supporting QoE configuration, whether the target node should discard the non-supporting QoE configuration or store it in order forward it to a subsequent node during future handovers/resume.**

Input for first round is appreciated by EOB Friday, August 20.

# 2 For the Chairman’s Notes

For the second round, please provide comments relative to the proposed agreements and discussion points listed below. Your comments are welcome in section 4 of this document.

**Issue 1 - Propagation of QMC configuration during mobility**

**Remove FFS in earlier agreement as follows: Include signaling based QoE measurement configuration in handover preparation messages i.e. in XnAP: HANDOVER REQUEST, NGAP: HANDOVER REQUEST. *The detail of signalling based QoE measurement configuration can be FFS.* ~~FFS on~~ No need for source NG-RAN node to include s-based QMC configuration in NGAP HANDOVER REQUIRED (FFS:** RAN3 to clarify the relationship between Trace function and QoE mechanism)**.**

Additional discussion:

- Option 1: After inter-node handover, the UE discards the QoE reports.

- Option 2: After inter-node handover, the UE sends the QoE reports to the target gNB. With this option no need to signal full QMC configuration from source to target gNB in this case, but MCE address (+ QoE Reference?, other info?) seem needed.

4 companies for option 1. 2 companies prefer to postpone the discussion.

**Issue 2 - Handling in case of HO to a non-supporting target gNB**

**Proposal: In case of HO to a non-supporting target gNB, the QMC configuration is not further propagated by the network but released or discarded.**

Comment: What about HO to a non-supporting target gNB but within the area scope, while following target gNB supports QMC.

Additional proposal:

Proposal: A gNB not supporting QoE can’t store a QoE configuration propagated from another node

**Issue 3 - Overriding configurations**

**Proposal: Signalling based QoE can override an existing management based QoE configuration.**

(Comes on top of existing agreement "Management based QoE should not override an existing signaling based QoE configuration.").

Need to further discuss overriding within the same QoE type (i.e. m-based overriding m-based, and s-based overriding s-based, e.g. based on priority). - no conclusion (override per QoE ID? per service type?)

**Issue 4 - Area scope handling**

On the question whether UE should keep performing the signalling/management based QoE measurement when UE is out of the area scope, wait for reply from RAN2 (RAN3 LS in ).

Additional WA? E.g.: "The ongoing QoE measurement should continue even if the UE move out of the area scope, and the QoE measurement not started yet should be released if move out of the area scope "

Additional proposals?:

* Proposal: During handover, target NG-RAN can release a QoE configuration autonomously without a deactivation command from OAM
* Proposal : Upon mobility outside the area scope, whether the target NG-RAN should release or pause the QoE configuration is up to implementation. SA4 can’t mandate when a NG-RAN can release the QoE configuration (e.g., only when there is no ongoing session) as this is node behaviour

**Issue 5 - Inter-node transfer of additional information**

**1) Signalling/management based QoE indication**

Should be concluded after resolution of issue 1 (inter-node mobility for m-based QMC)

**2) Pause status indication**

**Proposal: Request RAN2 to include pause status indication in RRC container (Source to Target Transparent Container).**

**3) Mark ongoing QoE measurement**

Wait for outcome of ongoing RAN2 discussion on mobility

# 3 Discussion

## 3.1 Issue 1 - Propagation of QMC configuration during mobility

The following open point has been captured by the chairman based on contributions to previous and present meeting:

*Whether a management based QoE configuration can be released before handover or if it must be propagated to target node to fulfil SA4 requirement on QoE measurement continuity; pending SA5 reply LS on support for management-based QoE and SA4 reply LS on ongoing session continuity requirement.*

**- Whether signaling and management based QoE support mobility continuity?**

Status as per moderator's understanding: There is currently consensus on propagation of s-based QMC configuration for Xn HO, while some companies indicate that the CN will send the required configuration directly to the target node (see 3947, 4074) in case of NG HO. Also, as captured at previous meeting, for m-based QMC configuration this question is pending SA5 and SA4 reply. Please comment whether something is missing or wrong in this status.

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| Company | Comment |
| Huawei | For the s-based QMC, we think the CN will send the required configuration directly to the target node in case of NG HO, same as the procedure in LTE. |
| Samsung | Agree with HW on the NG HO issue  Regarding the m-based QMC, in our understandings, during handover, the configuration can be released through the RRC reconfiguration message, if there is on-going QoE measurement in application layer, it will not be stopped according to current SA4 specification, there are two options for UE to handle this kind of QoE reports:  - Option 1: Discard the QoE reports.  - Option 2: Send the QoE reports to the target gNB.  For option 1, there is no need to transmit QoE measurement configuration over Xn, i.e. no management-based QoE configuration propagation.  For option 2, SRB4 should be setup in the target gNB and the target gNB should know the "Measurement Collection Entity IP Address" to deliver the QoE reports to the right place. In this case, there is still no need to propagate the whole management-based configuration, but some information transmitted on Xn or Uu may be needed for QoE report delivery. |
| CMCC | Agree most of SS’s comments with one minor disagreement: For option 2, CE Address should also be pre-configured at the target node for m-based. |
| ZTE | 1. We support s-based QoE mobility continuity. 2. We do not sure whether AMF can send the QoE configuration to the target node for NG HO. In LTE, RAN2 assumed that QoE is associated with the Trace function. However in NR, there is actually not any agreement on reusing Trace for QoE at current time and it depends on the discussion in CB#QoE2. Hence, we cannot directly agree that CN can send the required configuration directly to the target node. 3. The discussion on whether m-based QoE configuration supports mobility continuity can be postponed until RAN3 receives reply LS from other WGs(e.g. SA4, SA5). |
| China Telecom | For s-based QOE mobility, we support CN to send the required configuration directly to the target node. For m-based QOE mobility, we agree with ZTE’s view. |
| Qualcomm | For NG based HO, AMF can send s-based QoE configuration to target node. In our view, it doesn’t matter whether we reuse trace or not – AMF can remember the s-based QoE configuration at source and propagate to target.  For m-based QoE mobility, if SA4 agrees it is OK to discard ongoing QoE session upon receiving release, then we need not support mobility for m-based QoE and simply send release upon mobility. OAM can send s-based QoE configuration if it is interested in a specific UE and wants to track it across handovers. |
| CATT | Agree with moderator summary on this mobility  For NG HO, the AMF can send the configuration to target. We may request SA2 follow it.  For M-based, we don’t need propagate the configuration. But as SS’s said, there may be some coordination information transfer needed. |
| **Ericsson** | We thank the Moderator for providing the reference to the LS (in a private email exchange). The LS to SA5 that some companies refer to (R3-212975) contains only the following question wrt m-based QoE:  *Q5: Is there a mechanism to ensure uniqueness of the QoE Reference for area-based QMC, where UE selection is performed by the NG-RAN?*  In our view, since this is the only question related to m-based then the statement that m-based mobility depends on LS replies is **incorrect.** Moreover, the SA4 requirements are clear in that respect – the measurement continuity must be respected until the session end.  Given the discussion and the replies below, I think we can put up the following proposal for agreement:  **Proposal 1: RAN3 acknowledges the SA4 requirements stating that measurement continuity at mobility is supported for management based QoE.**  Please note that P1 **does not mean that m-based configuration is passed over Xn.**  Given that the m-based config is not passed from source to target, the target can conclude that an m-based measurement is configured/ongoing if source includes an explicit indication of m-based measurement status. Hence we propose:  **Proposal 2: At handover and RRC resume, the target/new node is informed about the status of management based QoE measurements at the UE (configured, ongoing).**  NOTE: our XnAP CR in 3316 needs to be modified, the *QoE Measurement Type* and *QoE Measurement Status* IEs need to be outside the meas config IE  **Proposal 3: At mobility and RRC resume for management based QoE, the MCE address is passed to the target RAN node explicitly.** |
| China Unicom | For s-based QMC, we share the same view with Huawei  For m-based QMC, we think mobility also need to be supported, the QoE configurations should be transferred to target |
| Nokia | For completeness, the status above also refers to LS to SA4 sent at previous meeting in R3-212953, and we believe SA4's reply to this LS will need to be taken into account for the question of handling of m-based QMC in case of mobility. |

**Summary:**

Based on the above discussion, it seems possible to solve FFS from earlier agreement as follows: Include signaling based QoE measurement configuration in handover preparation messages i.e. in XnAP: HANDOVER REQUEST, NGAP: HANDOVER REQUEST. No need for source NG-RAN node to include s-based QMC configuration in NGAP HANDOVER REQUIRED.

For m-based QMC, the following options need further discussion:

- Option 1: After inter-node handover, the UE discards the QoE reports.

- Option 2: After inter-node handover, the UE sends the QoE reports to the target gNB. With this option no need to signal full QMC configuration from source to target gNB in this case, but MCE address (+ QoE Reference?, other info?) seem needed.

## 3.2 Issue 2 - Handling in case of HO to a non-supporting target gNB

The following open point has been captured by the chairman based on contributions to previous and present meeting:

*Upon reception of a non-supporting QoE configuration, whether the target node should discard the non-supporting QoE configuration or store it in order forward it to a subsequent node during future handovers/resume.*

**- In the case when target gNB does not support QoE, RAN should release all QoE configuration? QoE reporting should be paused and the QoE configuration should be stored with limitation (e.g. a timer)? Target node should store the QoE configuration received from source node?**

Status as per moderator's understanding: In the submitted tdocs handling this question, there seems to be consensus to release the QMC configuration at the UE in this scenario. Please comment whether something is missing or wrong in this status.

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| Company | Comment |
| Huawei | We think the target node should release or just discard the QMC configuration for the UE (pending on its implementation), i.e. it will not propagate the QoE configuration to the next node. |
| Samsung | We support pause QoE reporting if the target doesn’t support QMC, the configuration should be propagated in case it will be used when UE moves out of the target. |
| CMCC | Share view with HW. |
| ZTE | We prefer to release all QoE configuration if the target node does not support QoE.  If a node does not support QoE, it cannot understand the QoE configuration data. From the RAN node point of view, if RAN3 finally support to store QoE configuration in a non-supporting target gNB, the target gNB has to store some unknown data. We do not think it is benefit for RAN node to store unknown data. |
| China Telecom | Agree with Samsung. We think the QOE configuration need to be propagated to next node. |
| Qualcomm | OK with either approaches – release or pause and store. Regarding pause approach, we seek clarification whether it is possible to store a non-supporting configuration in the NG-RAN. If possible, there are benefits to this approach. |
| CATT | We share with Samsung, pause QoE reporting if the target doesn’t support QMC, the configuration should be propagated even the target node does not support/or out the area. the benefit is clear if the UE move back to the area |
| **Ericsson** | A non-QoE-supporting target should **release** the measurement configuration. |
| China Unicom | The non-supporting gNB may not be able to store the QoE configuration, and the QoE configuration can be released. |
| Nokia | The target node will release all unknown (unsupported) configurations, including QMC configuration, as per legacy RRC mechanism (HO cmd). |

Summary:

* Release/discard configuration: 6 companies
* Propagate configuration: 3 companies
* Both options OK: 1 company

There seems to be a majority to release/discard the configuration.

**Proposal: In case of HO to a non-supporting target gNB, the QMC configuration is not further propagated by the network but released or discarded.**

## 3.3 Issue 3 - Overriding configurations

The following open point has been captured by the chairman based on contributions to previous and present meeting:

*Whether a management based QoE configuration can override another management based QoE configuration and whether a signaling based QoE configuration can override another signaling based QoE configuration.*

**- Discuss the following aspects on overriding issue: Whether the overriding scenario exists for management based QoE and signalling based QoE? Postpone the discussion and waiting for other WGs (e.g. RAN2, SA4) input? A signalling based QoE configuration can override another management based QoE configuration? A signaling based QoE configuration can override another signaling based QoE configuration? A management based QoE configuration can override another management based QoE configuration?**

Please provide your view.

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| --- | --- |
| Company | Comment |
| Huawei | A signalling based QoE configuration can override another management based QoE configuration.  A signaling based QoE configuration cannot override another signaling based QoE configuration  A management based QoE configuration can override another management based QoE configuration. |
| Samsung | We prefer follow the same principle as MDT. |
| CMCC | Prefer to reuse MDT principle:  S-based can override m-based.  New s-based will override old s-based with the same QoE Ref.  New m-based will override old m-based with the same QoE Ref.  (Recall that whether m-based is associated with a QoE Ref is FFS, but we assume QoE Ref should be introduced.) |
| ZTE | From our point of view, a s-based QoE configuration can override another s-based QoE configuration. And a m-based QoE configuration can override another m-based QoE configuration.  If only s-based QoE supports QoE mobility continuity, it is impossible that a s-based QoE will override a m-based QoE. |
| China Telecom | Agree with ZTE. |
| Qualcomm | Similar as above comments (but this can be FFS till m-based QoE mobility support is clear).  We want to highlight that we ended up defining a UE based solution to avoid overwriting s-based logged MDT with a m-based logged MDT. We would want to avoid such a UE based solution for QoE as well. And therefore, another reason to not support mobility of m-based QoE (if supported, we need to consider a lot more overwrite scenarios). |
| CATT | Agree with CMCC, the overriding should be happened in same QoE reference.  I don’t think the S-based always can override the M-Based. They may have different QoE reference. |
| **Ericsson** | An s- can override an m-.  We are open to discuss overriding within the same QoE type. |
| China Unicom | We propose for the QoE configuration overriding can rely on the priority configured by the OAM for each QoE configuration not matter what type of QoE measurement it is.  1. High priority QoE configuration can always override low priority QoE configuration;  2. Priority of s-based QoE configurations are always higher than m-based QoE configuration.  Since one UE may have s-based QoE configuration and m-based QoE configuration for different service type simultaneously, the QOE overriding should base on service type. |
| Nokia | Prefer to keep MDT principle. We believe that any kind of ARP-like (Allocation and Retention Priority) mechanism for QoE measurements could be overkill and also create excessive configuration burden. |

Summary:

Proposal: " Signalling based QoE can override an existing management based QoE configuration". (Comes on top of existing agreement "Management based QoE should not override an existing signaling based QoE configuration.").

Need to further discuss overriding within the same QoE type (i.e. m-based overriding m-based, and s-based overriding s-based, e.g. based on priority).

## 3.4 Issue 4 - Area scope handling

The following open point has been captured by the chairman based on contributions to the present meeting:

**- UE should keep performing the signalling/management based QoE measurement when UE is out of the area scope? Check with RAN2?**

Please provide your view.

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| Company | Comment |
| Huawei | It depends on RAN2 |
| Samsung | We already discussed this and sent LS to RAN2 at last meeting, let’s wait for the reply. |
| CMCC | Wait for RAN2. |
| ZTE | It is not appropriate for UE to keep performing either signalling based or management QoE measurement if the UE moves out of the area scope. And it is no possible for RAN2 to make any decision on this topic since RAN3 has already made agreement that NW is fully responsible for the area handling.  It is clear that SA4 is not responsible for the NW behavior. And SA4 does not directly describe that NW cannot stop an ongoing recording session in its spec. Meanwhile in SA5’s specification, TS28405, section, 4.2.3.1 forced deactivation, it explains how NW can forced stop the QOE measurement and reporting. More explanation can be found in issue 5. |
| China Telecom | UE cannot keep performing QOE measurement when it move of the area…Anyway, we can wait for RAN2 reply… |
| Qualcomm | Similar view as ZTE. RAN can either release or pause the QoE measurement when it is out of the area scope. |
| CATT | Wait for RAN2. This issue is ongoing measurement?. According to SA4 requirement, it should be |
| **Ericsson** | If you refer to the LS to RAN2 in 2976, this LS tells RAN2 what RAN3 decided (network-based solution), it does not ask to evaluate it.  In any case, as per SA4 requirements, QoE measurements **must proceed until the end of the session**, regardless of the are scope of the target, unless the target node does not support QoE, in which case the measurement configuration can be released. |
| **China Unicom** | Need to check with RAN2 :  UE should keep performing the signalling/management based QoE measurement when UE is out of the area scope  Anyway, we propose that the ongoing QoE measurement should continue even if the UE move out of the area scope, and the QoE measurement not started yet should be released if move out of the area scope. |
| Nokia | Agree with Samsung. Indeed, in the LS sent to RAN2 we indicated: "Option 1, where the network is responsible for keeping track of whether the UE is inside or outside the area and configures / releases configuration accordingly." So the network will release the configuration when the UE is out of the area scope |

Summary: On the question whether UE should keep performing the signalling/management based QoE measurement when UE is out of the area scope, wait for reply from RAN2 (RAN3 LS in ).

## 3.5 Issue 5 - Inter-node transfer of additional information

The following open point has been captured by the chairman based on contributions to previous and present meeting:

*Whether a QoE Measurement Type indicator is included in QoE configuration and signaled to target node during Handover preparation and Retrieve UE Context Procedures*

**- Introduce new IEs (e.g. indicate signalling/management based QoE, mark ongoing QoE measurement, indicate the pause status, etc) for QoE mobility?**

Please provide your view on whether any of this additional information, i.e. information available in the source node but not explicitly part of the QMC configuration provided by the OAM or the CN, should be transferred in case of inter-node mobility.

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| Company | Comment |
| Huawei | 1. We think the target node can know the type of QoE measurement based on the QoE configuration information in the Xn and the QoE configuration information in the RRC container within the handover preparation information. 2. For the ongoing QoE measurement, we think it depends on RAN2 progress. In our understanding, RAN2 will discuss it based on the previous LS on mobility from RAN3. 3. For the pause status, as commented in CB#QoE3 configuration, we think the target node can know which QoE measurement is paused based on the RRC container in the handover preparation information. |
| Samsung | There is no need for the indication of signalling/management based QoE, at least we should first confirm issue 1 and then discuss this.  For making on-going QoE measurement, agree with HW, it depends on RAN2  For the pause status, we think it’s needed, FFS on whether it’s inside or outside of the RRC container. |
| CMCC | Share view with SS. |
| ZTE | Based on our understanding, all new IEs shown above are not necessary. Our reasons are shown below:  **Signalling/management based QoE indication**: We do not think it is necessary. Based on our understanding, only signalling based QoE supports mobility continuity.  **Pause status indication**: We do not prefer to introduce this IE. Based on our understanding, the target node can get the QoE report from UE side. If majority companies believe this info should be transported from source to target node, we can add this info into RRC container (e.g. RRC Context). Hence, we do not need to introduce new IE for the Xn/NG-AP.  **Mark ongoing QoE measurement**: we also share the similar view with HW. In addition, QoE measurement can be released/stopped (different wording, same meaning) regardless of the QoE measurement status. The explanation is shown below:  *The QoE configuration shall only be checked by the client when each session starts, and thus all logging and reporting criterias for an ongoing session shall be unaffected by any QoE configuration changes received during that session. This also includes evaluation of any filtering criterias, such as geographical filtering, which shall only be done when the session starts. Thus changes to the QoE configuration will only affect sessions started after these configuration changes have been received.*  The content above can be found in in SA4’s TS 26.114. Based on our understanding, this means that **app layer** should check the criterion before QoE measurement initiating. After the measurement is initiated, **app layer** cannot stop an ongoing QoE measurement by itself and will not further check the criterion.  Meanwhile, in SA5’s TS 28.405:    (Feel free to zoom up if necessary)  The content in section 4.2.3.1 shows that from SA5’s point of view, RAN node can send a message to UE and stop/release the ongoing QoE measurement.  Considering SA4 is not responsible for defining NW behavior and there is no confliction between SA4’s content and SA5’s content shown above. More detail explanation on why we does not need the ongoing QoE indication and how does the HO procedure works without this indication can be found in our contribution **R3-214045**. So,  **QoE measurement can be released (or stopped, different wording, same meaning) regardless of the QoE measurement status. Therefore, the ongoing indication is not necessary.** |
| China Telecom | Agree with ZTE. |
| Qualcomm | No need of QoE type (s-based or m-based) if mobility for m-based QoE is not supported.  Mark ongoing QoE measurement is also not needed (NW can release/pause).  Regarding Pause status, it can be sent either as part of Source to Target Transparent Container or via inter-node signaling. Prefer the Source to Target Transparent Container along with other UE context information. |
| CATT | Agree with HW. |
| **Ericsson** | The target (or a new node in RRC resume) must know if an m-based measurement is only configured or ongoing (again, this does not mean sending the m-based config to the target). Based on the absence of s-based config in HO message and the measurement status indication (that we are proposing), target can conclude if there is any m-based measurement ongoing. |
| China Unicom | We propose to use the priority to distinguish the s-based QoE and m-based QoE, and the priority scope for each type of QoE measurement should be predefined in the protocol, there is no need to introduce new IE.  For the QoE configuration, we think the m-based QoE mobility should be supported, the area scope and other QoE configurations should be transferred to target gNB.  For on-going QoE measurement and pause status, we think they all need to send to target. Need to check the with RAN2 whether the on-going QoE measurement and pause status will be include in RRC container. If not, it should introduce new IE in NGAP and XnAP handover messages. |
| Nokia | Agree with QC. |

Summary:

**1) Signalling/management based QoE indication**

Should be concluded after resolution of issue 1 (inter-node mobility for m-based QMC)

**2) Pause status indication**

Proposal: Request RAN2 to include pause qtatus indication in RRC container (Source to Target Transparent Container).

**3) Mark ongoing QoE measurement**

Wait for outcome of ongoing RAN2 discussion on mobility

# 4 Second round

## 4.1 Comments on proposed agreements

Please provide comments, if any, on the proposed agreements.

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| Company | Comment |
|  | **Issue 4 - Area scope handling**  On the question whether UE should keep performing the signalling/management based QoE measurement when UE is out of the area scope, wait for reply from RAN2 (RAN3 LS in ).  We think the LS send to RAN2 is not very clear for RAN2 to evaluate how to do when out of scope, need further check.  Anyway, RAN3 should try to make some working assumptions to move forward.  We propose that the ongoing QoE measurement should continue even if the UE move out of the area scope, and the QoE measurement not started yet should be released if move out of the area scope. |
| Samsung | **Issue 2 - Handling in case of HO to a non-supporting target gNB**  **Proposal: In case of HO to a non-supporting target gNB, the QMC configuration is not further propagated by the network but released or discarded**  Comment on the above proposal:  What if HO to a non-supporting target gNB but it is in the area scope (please note that UE application layer is also capable of checking area) or what if the next target gNB supports NR QoE and also is in the area scope? We don’t think release the QoE configuration is a good choice.  In case of the target gNB can release the QoE configuration, it will not affect the on-going QoE measurement, so how to handle this kind of QoE report? Pause QoE reporting could be a good choice to keep the integrity of QoE reports, which also respects the requirement of SA4. |
| Qualcomm | **Issue 5 - Inter-node transfer of additional information**  **Proposal: Request RAN2 to include pause status indication in RRC container (Source to Target Transparent Container).**   * If agreed, are we sending an LS to RAN2 this meeting? This is also proposed in **CB # QoE3\_Configuration\_Report**   **Issue 4 - Area scope handling**  OK to wait for RAN2. But the following are the proposals in RAN2 email discussion: [AT115-e][046][QoE] Mobility  **Proposal P3\_rev: During the handover to target gNB which supports QoE, the target gNB decides which QoE configurations to keep and which to release during a handover, e.g. based on QoE configuration information received from the source gNB in Xn signalling and/or UE’s current RRC configuration of QoE.**  **Proposal [046]-1: FFS whether the UE needs to inform the gNB when the QoE measurement session starts or when the session ends, e.g. to enable QoE configuration handling upon mobility or for QoE activation/deactivation procedures (pending SA4 reply on the ongoing QoE measurement session continuity requirement).**  Based on the above, we propose the following to have some common understanding before the next meeting:   * Proposal 1: During handover, target NG-RAN can release a QoE configuration autonomously without a deactivation command from OAM * Proposal 2: Upon mobility outside the area scope, whether the target NG-RAN should release or pause the QoE configuration is up to implementation. SA4 can’t mandate when a NG-RAN can release the QoE configuration (e.g., only when there is no ongoing session) as this is node behaviour   **Issue 2 - Handling in case of HO to a non-supporting target gNB**  Can we confirm that a gNB not supporting QoE can’t store a QoE configuration propagated from another node? Only if it can store, pause/resume would work in case of mobility to a non-supporting gNB   * Proposal 3: A gNB not supporting QoE can’t store a QoE configuration propagated from another node |
| CMCC | We are fine with all proposals summarized by the moderator.  But we are not sure whether we need Proposal 1 as provided by QC. Our understanding is that without mobility the QoE configuration release is mostly driven by QMC deactivation from OAM, but during mobility the source/target will not wait for QMC deactivation from OAM. Of course it is up to the target to decide whether to release the QoE configuration, but in our opinion the target decision needs to be based on some rules, e.g. when the target doesn’t support QoE, or the target is out of QoE measurement area and UE does not have an ongoing session. So in most of the cases during mobility, i.e. the target also support QoE or the target is still within the area scope, even though there’s no ongoing session, the target cannot totally count on implementation to release QoE configuration over Uu. So we are not sure whether a ‘can’ term in Proposal 1 can bring benefits to further discussion.  BTW, we are fine with Proposal 2 & 3 by QC. |
| ZTE | **Issue 1 - Propagation of QMC configuration during mobility**  **Include signaling based QoE measurement configuration in handover preparation messages i.e. in XnAP: HANDOVER REQUEST, NGAP: HANDOVER REQUEST. ~~FFS on~~ No need for source NG-RAN node to include s-based QMC configuration in NGAP HANDOVER REQUIRED.**  We are generally agree with the 1st sentence. Do we need to add some clarification on the *signalling based QoE measurement configuration*? E.g. Is it the full config or partial config? Considering the limit time budget in this meeting, we prefer to add a FFS on the signalling based QoE measurement configuration. The modification is shown below:  *Include signaling based QoE measurement configuration in handover preparation messages i.e. in XnAP: HANDOVER REQUEST, NGAP: HANDOVER REQUEST.* ***The detail of signalling based QoE measurement configuration can be FFS.***  For 2nd sentence, we do not think RAN3 can directly make this agreement. As we explained in the phase 1 discussion, in LTE, RAN2 assumed that QoE is associated with the Trace function. However in NR, there is actually not any agreement on reusing Trace for QoE at current time. Hence, we think RAN3 need to clarify the relationship between Trace function and QoE mechanism before we further discuss this issue.  **Issue 4 - Area scope handling**  We share the similar view with the first company(China Unicom?).  As far as we know, RAN2 is not discussing the area scope issue this meeting. The LS RAN3 sent previously is only about which entity is responsible for the area scope checking. Based on my understanding, discussion on whether to stop QoE measurement in this case is out of RAN2 scope. This part should be discussed in RAN3.  **Issue 5 - Inter-node transfer of additional information**  **1) Signalling/management based QoE indication**  Please check our comments in section 4.2.   1. **Pause status indication**   We are fine to send RAN2 LS and ask RAN2 to add the **QoE pause status information** into the RRC container. Detail format of this information can be decided by RAN2.  **3) Mark ongoing QoE measurement**  We do not think this IE is necessary. The detail explanation can be found in the phase 1 discussion. |

## 4.2 Issue 1 - continued

Please provide your view and comments on the following options for m-based QMC:

- Option 1: After inter-node handover, the UE discards the QoE reports.

- Option 2: After inter-node handover, the UE sends the QoE reports to the target gNB. With this option no need to signal full QMC configuration from source to target gNB in this case, but MCE address (+ QoE Reference?, other info?) seem needed.

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| Company | Comment |
| China Unicom | Option2, and we think the area scope, QoE reference, on-going QoE measurement and pause status also need to be transferred to target node. |
| Samsung | Prefer option 2, if the intension of the SA4’s requirement (i.e. the on-going measurement will not be changed until the session ends) is to keep the integrity of QoE report, option 2 seems more qualified for the requirement. |
| Qualcomm | Option 2 is fine in case a release is not sent for m-based QoE during mobility. We clarify further below:  This is also related to Proposal 1 and 2 mentioned in our comments in section 4.1 i.e., we first need to decide whether an NG-RAN is free to release a m-based QoE configuration before the handover (if SA4 confirms QoE measurement continuity can’t be ensured in case a release is sent). We propose the following:  Proposal 4: Upon mobility, whether the target NG-RAN can release a m-based QoE configuration is up to implementation. In case a release is not sent, Option 2 can be used. |
| CMCC | Option 2 seems fine.  For Proposal 4 given by QC, please see our answer in 4.1. |
| ZTE | Postpone the discussion.  We believe the discussion on whether UE should send the QoE report to the target node belongs to the m-based QoE mobility continuity. Considering RAN3 has already sent a LS on this issue, we prefer to postpone the discussion on m-based QoE mobility continuity until RAN3 receives reply from other WGs(e.g. SA4, SA5). |
| Nokia | Postpone the discussion. We believe the situation will become clearer after replies from SA4 (about their specification status) and SA5 (reference allocation for m-based QMC). |

## 4.3 Issue 3 - continued

Please provide your view on overriding within the same QoE type (i.e. m-based overriding m-based, and s-based overriding s-based, e.g. based on priority).

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| Company | Comment |
| China Unicom | We propose that the QoE configuration overriding can rely on the priority configured by the OAM for each QoE configuration not matter what type of QoE measurement it is.  Some general principles:  1. High priority QoE configuration can always override low priority QoE configuration;  2. Priority of s-based QoE configurations are always higher than m-based QoE configuration.  Since one UE may have s-based QoE configuration and m-based QoE configuration for different service type simultaneously, the QOE overriding should base on service type.  For the overriding within the same QoE type, high priority QoE configuration can always override low priority QoE configuration. And the OAM can control the overriding procedure for certain service type. |
| Samsung | I think we should firstly have common understanding on this overriding issue, whether it’s for the same QoE reference or for the same service type. In our view, both are possible.  If it’s for the same QoE reference, we can follow the MDT principle.  If it’s for the same service type, new s-based can override s-based, new m-based can override m-based, as the OAM knows the old configuration for the same service type, if OAM sends a new configuration, it implicitly indicates the new one can override the old one, otherwise it will not sent the new configuration for the same service type. |
| Qualcomm | Considering there might be multiple QoE configurations per service type, we think that the **override should be checked per QoE reference ID.** This will also keep the criteria for overriding simple. We therefore propose the following change:  Signalling based QoE can override an existing management based QoE configuration only if the QoE Reference ID is the same |
| CMCC | Share view with QC. |
| ZTE | We share the similar view with QCM that the override should be checked per QoE ID. |
| Nokia | We believe that sending a new configuration using existing QoE ID is an error case, meaning that the UE could simply ignore it (and OAM should avoid such errors). Otherwise it implies that modification of QMC configuration is supported.  More generally, override depends on whether multiple QMC configurations are supported per e.g. service type. If multiple configurations are supported, there is no override but simply just one more QMC configuration to be handled by the UE.  We believe that:   * a single QMC configuration should be supported per service type * m-based should not override s-based * s-based will override s-based, in the sense that the last configuration sent is the valid one |

# 5 Conclusion, Recommendations [if needed]

If needed

# 6 References

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| [R3-213316](file:///D:\会议硬盘\TSGR3_113-e\Docs\R3-213316.zip) | CR TS 38.423 Mobility Support for NR QoE Measurement Collection (Ericsson) | CR0639r, TS 38.423 v16.6.0, Rel-17, Cat. B |
| [R3-213319](file:///D:\会议硬盘\TSGR3_113-e\Docs\R3-213319.zip) | QoE Mobility Support (Ericsson) | discussion |
| [R3-213490](file:///D:\会议硬盘\TSGR3_113-e\Docs\R3-213490.zip) | QoE measurement in mobility scenarios (China Unicom, China Southern Power Grid) | discussion |
| [R3-213655](file:///D:\会议硬盘\TSGR3_113-e\Docs\R3-213655.zip) | QoE measurement collection and reporting continuity in mobility scenarios (Qualcomm Incorporated) | discussion |
| [R3-213684](file:///D:\会议硬盘\TSGR3_113-e\Docs\R3-213684.zip) | Open issues on mobility (Nokia, Nokia Shanghai Bell) | discussion |
| [R3-213947](file:///D:\会议硬盘\TSGR3_113-e\Docs\R3-213947.zip) | Discussion on Measurement Collection and Continuity in Intra-System Intra-RAT Mobility (CATT) | discussion |
| [R3-214045](file:///D:\会议硬盘\TSGR3_113-e\Docs\R3-214045.zip) | Discussion on Measurement Collection and Continuity in Intra-System Intra-RAT Mobility (ZTE, China Telecom, China Unicom) | discussion |
| [R3-214074](file:///D:\会议硬盘\TSGR3_113-e\Docs\R3-214074.zip) | Further discussions on measurement Collection and Continuity in Intra-System Intra-RAT Mobility (Huawei) | discussion |
| [R3-214131](file:///D:\会议硬盘\TSGR3_113-e\Docs\R3-214131.zip) | On the reception of QoE configuration in a non-supporting node (China Telecom Corporation Ltd.) | discussion |