**3GPP TSG-RAN WG3 Meeting #119-bis-eR3-231876**

**Online, April 17th – 26th 2023**

Agenda Item: 11.3

Source: Ericsson (moderator)

Title: CB: # QoE3\_NR-DC - Summary of email discussion

Document for: Approval

# Introduction

The deadline for providing replies to Phase 2 is **Tuesday, April 18th at 23:59 UTC.**

**Relevant papers:**

**[Sam1217]** Remaining open issues on support of NR-DC (Samsung)

**[CATT1319]** Discussion on Support for legacy QoE in NR-DC (CATT)

**[CATT1320]** Discussion on Support for RV-QoE in NR-DC (CATT)

**[QC1346]** Support for QoE in NR-DC (Qualcomm Incorporated)

**[Len1431]** Discussion on QoE measurement in NR-DC (Lenovo)

**[Eri1488]** (TP for QoE BL CR for TS 38.300) QoE and RVQoE Measurements and Reporting in NR-DC Scenarios (Ericsson)

**[Xmi1520]** Discussion on QoE configuration and reporting in NR-DC (Xiaomi)

**[Nok1626]** Further discussion on SN-triggered m-based QMC (Nokia, Nokia Shanghai Bell)

**[ZTE1776]** Further Consideration on QoE in NR-DC (ZTE, China Telecom, CMCC)

**[ZTE1778]** TPs to BL CR of 38.401 and BL CR of 38.423 on NR QoE (ZTE, China Telecom)

**[Hua1818]** Further discussions on the support for QoE in NR-DC (Huawei)

**[CU1830]** Further discussion on QoE measurement in NR-DC (China Unicom)

# For the Chairman notes

# Round 1

## draftCR for TS 38.300

The draftCR in **R3-231919** is uploaded in the CB folder. It almost entirely consists of previous agreements. The additions from the discussions in the present CB are marked.

## QoE measurement configuration

### QoE measurement configuration

When the SN expresses its interest for configuring the UE with m-QoE to the MN, it needs to indicate certain information about the m-based QoE configuration.

**Qx: Which of the following information needs to be included in the message by which the SN expresses to the MN its interest in configuring a UE with an m-based QoE measurement:**

1. **QoE reference**
2. **Service type indication**
3. **Area scope**
4. **MCE IP address**
5. **Slice scope**
6. **MDT alignment information**
7. **Available RVQoE metrics**
8. **QoE configuration container**

|  |  |  |
| --- | --- | --- |
| **Company** | **Answer** | **Comment** |
| **Ericsson** | **Only a)** | We assume that both nodes have received this m-based QoE configuration from the OAM, and no other configuration information except for the QoE reference is needed. |
| Qualcomm | At least a), b), h) | **To Ericsson: Why are we not considering a case where only SN received the m-based QoE configuration from OAM?** (e.g., PCell is NOT in area scope whereas PSCell is in area scope)  If only SN receives the m-based QoE configuration from OAM and MN decides to send the QoE configuration itself when SN expresses its interest, the SN should send the whole QoE configuration (or at least a, b and h) in a one-step or two-step procedure right?  Regarding c) and e), **RAN3 should discuss whether the node which receives the QoE configuration from OAM should check the area scope and slice scope** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

### Coordination of RRC IDs

The issue is related to the following TBC:

**FFS on whether a pool of RRC ID is split between MN and SN or whether it is per measurement.**

**PP-1: The MN and the SN coordinate the RRC ID allocation for both s- and m-based QoE/RVQoE measurements to be configured at a UE, on a per-configuration basis.**

**PP-2: When the MN approves that the SN configures the UE with a certain m-based QoE configuration, the MN assigns an RRC ID for this m-based QoE configuration and indicates it to the SN.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/disagree** | **Comment** |
| **Ericsson** | **Agree to both** |  |
| Qualcomm | Agree to both |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

## QoE measurement reporting

### Default QoE reporting behavior

RAN3 needs to discuss the default QoE reporting behaviour in case the UE is not explicitly instructed to send the reports to a certain node.

**PP: By default (i.e., until the reporting leg is changed), upon session start, the QoE/RVQoE reports are sent to the node that sent the QoE/RVQoE configuration to the UE, using the same path.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/disagree** | **Comment** |
| **Ericsson** | **Agree** |  |
| Qualcomm | Disagree | **If the above proposal is followed:**  **Case 1:** MN sends QoE/RVQoE configuration to UE via SRB1 (or tunnelled via SRB3)  🡪 UE sends QoE/RVQoE report to MN via SRB4  **Case 2:** SN sends QoE/RVQoE configuration to UE via SRB3 (or tunneled via SRB1)  🡪 UE sends QoE /RVQoE report to SN via SRB5  The above proposal might work for case 1, but saying that QoE/RVQoE reports should by default be sent to SN via SRB5 (in case 2) **is not a good option in case the UE or SN doesn’t support SRB5** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

### Inter-node coordination for reporting

**PP: When indicating its interest in configuring m-based QoE a measurement to a UE:**

* **The SN indicates to the MN whether it prefers to receive the QoE reports via SRB5, or inside a container via the MN (using SRB4).**
* **If the MN approves the SN’s request, it indicates which option should be used for reporting (SRB5 or a container via the MN using SRB4).**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/disagree** | **Comment** |
| **Ericsson** | **Agree** | The SN should be able to receive QoE reports even if it does not support the SRB5. |
| Qualcomm | Need clarification | Suppose SN indicates to MN that it prefers to receive QoE reports inside a container via the MN (using SRB4), **can the MN go against SN’s preference** and indicate to use SRB5? But what if SN doesn’t support SRB5 – would it send a reject back to MN? |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

### Explicit/implicit command for switching of reporting leg

**PP: The network can explicitly instruct a UE in NR-DC to switch the reporting leg, per QoE configuration.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/disagree** | **Comment** |
| **Ericsson** | **Agree** | Implicit indication via SRB establishment/removal does not work since the network should be able to switch the reporting leg per configuration. |
| Qualcomm | Partly agree with modifications | We would like to point out that there is no real use case to report encapsulated QoE configurations in two different reporting legs at the same time   * When MN is overloaded, UE should report all encapsulated QoE configurations via SRB5 * When SN is overloaded, UE should report all encapsulated QoE configurations via SRB4   The only use case where having two separate legs might make sense is to report different RVQoE reports to MN (via SRB4) and SN (via SRB5) after figuring out the node that provides the DRB for the application. This is also to just avoid forwarding over Xn thereby saving latency and not absolutely necessary .  We are OK to consider the above proposal with this change below:  **Modified Proposal:**   * **The network can explicitly instruct a UE in NR-DC to switch the reporting leg** * **Reporting leg switch is common for all encapsulated QoE configurations** * **Reporting leg switch can be different per RVQoE configuration** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

### Coordination and sending the leg switching command to the UE

Based on the papers, the Moderator derives the following potential proposals:

**PP-1: The leg switching command is sent to the UE by the node that configured that specific QoE configuration.**

**PP-2: The node that currently receives the QoE reports via the Uu should be able to request the QoE reporting leg switch from the other node.**

**PP-3: The leg switch needs to be approved by the node that is bound to start receiving the reports.**

**PP-4: The SN may send the reporting leg switching command to the UE via SRB3 or SRB1.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/disagree** | **Comment** |
| **Ericsson** | **Agree to all** | The **main principles** should be:   * The node that “owns the QoE configuration” instructs the UE to switch the reporting leg. * A node cannot force another node to receive the QoE reports. |
| Qualcomm | Agree to all |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

### Other node sending reports to MCE

The outstanding questions is: if a peer node of the node that configured the UE with QoE measurements receives the QoE reports and forwards them to the MCE, should the peer node be notified about the RRC ID pertaining to the measurement configuration (in addition to the MCE IP address and QoE reference)?

**PP: The node that has configured the UE with QoE measurements should indicate the QoE Reference, the MCE IP Address and the RRC ID to the node that receives the reports, so that the node receives the QoE report can forward the QoE report directly to MCE.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/disagree** | **Comment** |
| **Ericsson** | **Agree** | The MN needs to indicate to the SN the RRC ID, so that the SN can associate the RRC ID in the received reports with the QoE reference. |
| Qualcomm | Agree |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

## RVQoE measurement reporting

### Whether RVQoE and QoE can be reported to different nodes

**Q: Which option do you prefer:**

* **Option 1: QoE reports and RVQoE reports pertaining to the same QoE reference are always sent over the same leg.**
* **Option 2: QoE reports and RVQoE reports pertaining to the same QoE reference can be sent over different legs.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Answer** | **Comment** |
| **Ericsson** | **Q: B** | **Motivation:**   * The QoE and RVQoE reports can already be sent at different periodicities, i.e., in different messages. * The RVQoE reporting is not paused at overload, as opposed to the QoE reporting. * The node delivering the application session to the UE may change, which means that the appropriate recipient of RVQoE reports may change. Meanwhile, the recipient of QoE reports does not change, it is always the MCE. * Being forced to send the RVQoE reports via the node that is not their ultimate recipient significantly adds to reporting latency. |
| Qualcomm | B |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

### RVQoE reporting path

**PP-1: If the SN does not support or does not configure the SRB5, the RVQoE reports can be tunnelled on the SRB4 from the UE via the MN to the SN.**

**PP-2: RRC Transfer procedure can be considered to transfer the RVQoE report between MN and SN.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/disagree** | **Comment** |
| **Ericsson** | **Agree to both** | Moreover, we think that the PP-2 should apply to:   1. Tunnelling of RVQoE reports from UE via the MN to the SN 2. Forwarding of RVQoE reports between the MN and the SN, e.g., in case both nodes should receive the RVQoE reports. |
| Qualcomm | Agree to both | PP-2: OK to consider a new Xn message as well |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

### RVQoE reporting when the other node carries the session

When a node determines that its peer node provides the bearer(s) for the application session, the peer node should receive the reports, but only if it wants to.

**PP: The node that determined that its peer node provides the bearer(s) for a session should inquire the peer node whether the peer node is interested in receiving the RVQoE reports.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/disagree** | **Comment** |
| **Ericsson** | **Agree** | Similar to what we agreed for F1AP, a node should not force the other node to receive the RVQoE reports. |
| Qualcomm | Agree |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

## RVQoE measurement configuration

### General principles of RVQoE measurement configuration

**Q: Do you agree with the following statements:**

1. **The node that sends the QoE measurement configuration to a UE is the node that generates the corresponding RVQoE measurement configuration.**
2. **The node that has initially configured a UE with an RVQoE configuration remains the owner of the RVQoE configuration until the configuration is released or until the node stops serving the UE.**
3. **There may exist only one RVQoE configuration per QoE configuration.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Answer** | **Comment** |
| **Ericsson** | **Agree with all** |  |
| Qualcomm | Agree with all |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

### What happens if the peer node provides the bearer(s) for the application session

**PP: When a node receiving an RVQoE report determines that the peer node provides the bearer(s) for the application session:**

* + **The node asks the peer node whether the peer node is interested in receiving the RVQoE reports.**
  + **The node asks the peer node which SRB (and tunnel, if applicable) should be used for delivering the RVQoE reports to the peer node.**
  + **The node asks the peer node to provide the (updated) RVQoE configuration that the node should send to the UE.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/disagree** | **Comment** |
| **Ericsson** | **Agree** |  |
| Qualcomm | Agree with one question | What is meant by the tunnel in 2nd bullet? |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

### Sending the RVQoE configuration from the SN to the UE

**PP: The SN can send an RVQoE configuration directly to UE via SRB3 or via split SRB1.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Agree/disagree** | **Comment** |
| **Ericsson** | **Agree** |  |
| Qualcomm | Agree |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

## The MN-SN coordination procedure

**Q: Should the UE-associated XnAP MN-SN coordination procedure be:**

* **Option A: A newly defined procedure?**
* **Option B: An enhanced existing procedure?**

|  |  |  |
| --- | --- | --- |
| **Company** | **Answer** | **Comment** |
| **Ericsson** | **A** | Option **B would impact too many existing procedures**, at least:   * S-NG-RAN node Addition Preparation. * M-NG-RAN node initiated S-NG-RAN node Modification Preparation. * S-NG-RAN node initiated S-NG-RAN node Modification. * S-NG-RAN node initiated S-NG-RAN node Change. * M-NG-RAN node initiated S-NG-RAN node Release. * S-NG-RAN node initiated S-NG-RAN node Release. |
| Qualcomm | A is OK, but some clarification needed | Option A is fine, but **when would this new message be exchanged between MN and SN in this case (i.e., when should coordination happen?)** or is this left to implementation? Or do we have to define interaction of this new message with the procedures mentioned above? |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**

## Additional relevant scenarios

**Q: Should RAN3 consider the QoE measurement reporting for NR-DC in following scenarios:**

1. **SCG failure.**
2. **SN release scenarios.**
3. **RAN overload scenario.**

|  |  |  |
| --- | --- | --- |
| **Company** | **Answer** | **Comment** |
| **Ericsson** | **Yes to all** | These are all realistic use cases, and we should enable QoE reporting continuity therein. |
| Qualcomm | Yes to all |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

**Summary:**

**Proposal:**