N3GPP TSG-RAN WG2 Meeting #123bis R2-230xxxx

Xiamen, China, 09 – 13 October 2023

**Agenda item: 7.14.1**

**Source: Nokia (Rapporteur)**

**Title: [Post123bis][618][QoE] 37.340 CR update and open issues (Nokia)**

**WID/SID: NR\_QoE\_enh-Core - Release 18**

**Document for: Discussion and Decision**

# 1 Introduction

This document is the report of the following email discussion:

* [Post123bis][618][QoE] 37.340 CR update and open issues (Nokia)

Scope: Running CR update and open issues

Intended outcome:

* Endorsed running CR
* List of open issues for TS 37.340 in the annex of the CR

Deadline: Medium (two weeks)

# 2 Contact Points

Respondents to the email discussion are kindly asked to fill in the following table.

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| --- | --- | --- |
| Company | Name | Email Address |
| Nokia | Ping Yuan | Ping.1.Yuan@nokia-sbell.com |
| NEC | Satoaki Hayashi | Satoaki-hayashi@nec.com |
| ZTE | Zhihong Qiu | qiu.zhihong@zte.com.cn |
| Huawei, HiSilicon | Jun Chen | jun.chen@huawei.com |
| Qualcomm | Jianhua Liu | jianhua@qti.qualcomm.com |
| Ericsson | Cecilia Eklöf | cecilia.eklof@ericsson.com |
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# 3 Discussion

In the remaining open issues summary [1] for RAN2#123bis meeting, below open issues were listed for supporting QoE measurement in NR-DC.

Table 3: open issue list for supporting QoE measurement in NR-DC

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| **Topic** | **Open issues** | **Related to the completion of the WI (Yes/No)** | **Remark** |
| (1) RVQoE reporting | a) Whether to use explicit SRB indication for RVQoE reporting?  b) Whether RVQoE reports and encapsulated QoE reports are reported together to the same node (MN or SN) in NR-DC [2]?  c) As working assumption, for encapsulated QoE report associated with the non-receiving RAN node, use option 1 (i.e.MeasurementReportAppLayer message) to send to the receiving RAN node. This can be revisited if RAN3 decisions warrant something different for RVQoE. | Yes | For a), as per RAN3 agreements at RAN3#121 meeting, RAN3 has agreed to define two different reporting leg indications for QoE and RVQoE.  For b) RAN3#119bis made WA that QoE reports and RVQoE reports pertaining to the same QoE reference can be sent over different legs. RAN3#120 agreed that the non-RVQoE-configuring node can indicate to the RVQoE-configuring node that it does not want to receive the RVQoE reports.  For c), an LS (R2-2309004) has been sent to RAN3 to check if the WA can be confirmed. |
| (2) SCG activation | a) FFS on whether mapping SRB5 to MN or pause QoE reporting when SCG is deactivated requires any specification impacts?  b) FFS on whether UE should request to activate SCG only for the purpose of RVQoE reporting via SRB5? | Yes | For a) RAN2#123 meeting agreed to follow Rel-17 principles: UE indicates data availability for DRBs when requesting SCG activation. It is up to NW implementation to map SRB5 to MN or pause QoE reporting when SCG is deactivated.  For b) RAN3#120 agreed that the non-RVQoE-configuring node can indicate whether it prefers to receive the RVQoE reports directly from the UE. |

For RVQoE reporting open issue “a) Whether to use explicit SRB indication for RVQoE reporting?”, we observed RAN3 has agreed to capture below sentence in the TP for QoE BL CR for TS 37.340 [2] that the network explicitly indicates to the UE the SRB for RVQoE reporting per QoE reference.

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| The network explicitly indicates to the UE whether to send QoE reports via SRB4 or SRB5, per QoE reference, separately for QoE reports and RAN visible QoE reports. |

Therefore, RAN2 can follow RAN3 agreement and there is no need to further discuss the issue in RAN2.

**Question 1: Do companies agree that the network can use explicit indication per QoE config to indicate which SRB is used for RVQoE reporting?**

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| Answers to Question 1 | | |
| Company | Yes/No | Technical Arguments |
| NEC | Yes | RAN2#123 agreement: In Rel-18, network always configures SRB usage for each QoE reporting explicitly.  RAN3#121 agreement: Define two different reporting leg indications for QoE and RVQoE. |
| ZTE | Yes | This is already confirmed in RAN2#123bis, also being captured in RRC CR as well.   * RAN2 confirms RAN3 agreements from this LS, i.e.   + - For s-based QoE configuration received by MN       * MN sends the QoE configuration via SRB1       * QoE reports can be sent via SRB4 or SRB5     - WA: The transparent reporting for RVQoE over RRC is not supported.     - Define two different reporting leg indications for QoE and RVQoE.     - For a UE in NR-DC, each legacy QoE configuration can have only one corresponding RVQoE configuration when needed. |
| Huawei, HiSilicon | Yes | We have already this in the previous meeting:   * **RAN2 confirms RAN3 agreements from this LS, i.e.**   + **For s-based QoE configuration received by MN**     - **MN sends the QoE configuration via SRB1**     - **QoE reports can be sent via SRB4 or SRB5**   + **WA: The transparent reporting for RVQoE over RRC is not supported.**   + **Define two different reporting leg indications for QoE and RVQoE.**   + **For a UE in NR-DC, each legacy QoE configuration can have only one corresponding RVQoE configuration when needed.** |
| Qualcomm | Yes |  |
| Ericsson | Yes | Already agreed and implemented in RRC. |
| Nokia | Yes |  |
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**Summary 1**: All companies agree that network can use explicit indication per QoE config to indicate which SRB is used for RVQoE reporting. Companies indicate RAN2-123bis agreements can address the issue already. Therefore, the issue can be closed and there is no need to have proposal for this question.

For RVQoE reporting open issue “b) Whether RVQoE reports and encapsulated QoE reports are reported together to the same node (MN or SN) in NR-DC”, based on RAN3’s agreements, [3] proposes that RVQoE reports and encapsulated QoE reports can be reported separately to the different nodes (MN or SN) in NR-DC.

**Question 2**: **Do companies agree that RVQoE reports and encapsulated QoE reports can be reported separately to the different nodes (MN or SN) in NR-DC ?**

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| Answers to Question 2 | | |
| Company | Yes/No | Technical Arguments |
| NEC | Yes | RAN3#121 agreement: Define two different reporting leg indications for QoE and RVQoE. |
| ZTE | Yes, but | Based on the separated indications it can already be supported based on current signalling, there is no additional RAN2 impacts. No RAN2 agreement is needed on this topic. |
| Huawei, HiSilicon | Yes | We have already this in the previous meeting.   * **RAN2 confirms RAN3 agreements from this LS, i.e.**   + **For s-based QoE configuration received by MN**     - **MN sends the QoE configuration via SRB1**     - **QoE reports can be sent via SRB4 or SRB5**   + **WA: The transparent reporting for RVQoE over RRC is not supported.**   + **Define two different reporting leg indications for QoE and RVQoE.**   + **For a UE in NR-DC, each legacy QoE configuration can have only one corresponding RVQoE configuration when needed.** |
| Qualcomm | Yes |  |
| Ericsson | Yes | Already agreed and implemented. |
| Nokia | Yes |  |
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**Summary 2**: All companies agree that RVQoE reports and encapsulated QoE reports can be reported separately to the different nodes (MN or SN) in NR-DC. Companies indicate RAN2-123bis agreements can address the issue already. Therefore, the issue can be closed and there is no need to have proposal for this question.

For open issue regarding the working assumption to report the encapsulated QoE and RVQoE report associated with the non-receiving RAN node by using MeasurementReportAppLayer message, RAN2 has confirmed the WA in RAN2#123bis meeting and RAN3 also indicates they don’t see any issue with this working assumption in LS [4]. Therefore, the open issue can be closed without further discussion.

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| **RAN2#123bis Agreement:**  QoE report (e.g., either encapsulated QoE or RVQoE) associated with the non-receiving RAN node, can be send to the receiving RAN node via MeasurementReportAppLayer message if configured by NW.  QoE report over ULInformationTransferMRDC is not supported. |

For SCG activation open issue “a) FFS on whether mapping SRB5 to MN or pause QoE reporting when SCG is deactivated requires any specification impacts?”, in our understanding, the change of SRB for QoE reporting and the pausing of QoE reporting per QoE configuration have been supported in current RRC running CR. Therefore, we think the details specification impact can be discussed in Stage-3 RRC running CR review.

Furthermore, when SCG is deactivated, on top of mapping SRB5 to MN or pausing the QoE reporting, the network may also release the corresponding QoE configurations.

**Question 3**: **Do companies agree that, for QoE reporting configured to be reported via SRB5, when SCG is deactivated it is NW implementation to map SRB5 to MN, release the corresponding QoE configurations or pause the QoE reporting?**

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| Answers to Question 3 | | |
| Company | Yes/No | Technical Arguments |
| NEC | Yes | No spec impact foreseen. |
| ZTE | Yes | Same view as NEC. One clarification, we understand that the proposal is for both RVQoE and encapsulated QoE, and the opening issue is mainly on RVQoE. Therefore to avoid repeated discussion, it is suggested to have the same agreement as well for RVQoE that “UE shall not request to activate SN just for the purpose of RVQoE reporting.” |
| Huawei, HiSilicon | Yes | We think we can clarify this assumption in 37.340. |
| Qualcomm | Yes |  |
| Ericsson | Yes | We are fine with the behaviour, details can be discussed as part of the RRC review. |
| Nokia | Yes | Agree with Huawei and Ericsson. |
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**Summary 3**: All companies agree that when SCG is deactivated, on top of mapping SRB5 to MN or pausing the QoE reporting, the network may also release the corresponding QoE configurations. ZTE comment to have the agreement for RVQoE that “UE shall not request to activate SN just for the purpose of RVQoE reporting.”. It is Rapporteur’s understanding that, the agreement has been captured in RAN2-123bis meeting.

**Proposal 1**: **For QoE reporting configured to be reported via SRB5, when SCG is deactivated, it is NW implementation to map SRB5 to MN, release the corresponding QoE configurations or pause the QoE reporting**.

For SCG activation open issue “b) FFS on whether UE should request to activate SCG only for the purpose of RVQoE reporting via SRB5?”, RAN2-123bis meeting has agreed UE should not request to activate SCG only for the purpose of RVQoE reporting via SRB5. The open issue can be closed.

Furthermore, when the UE cannot send a QoE report because the configured SRB is not available, it was agreed UE should continue to store the reports until the SRB is available or the QoE configuration is released. However, the agreement reached in RAN2#123 meeting does not distinguish between container-based and RAN-visible QoE. Obviously, UE is not required to buffer the RVQoE report as agreed in RAN2#123bis meeting.

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| **RAN2#123 Agreement:**  If UL traffic arrives and the UE cannot send a QoE report because the configured SRB is not available, UE continues to store the report until the SRB is available or the QoE configuration is released.  **RAN2#123bis Agreement:**  When UE cannot send RVQoE report because the configured RVQoE specific SRB is not available, UE is not required to buffer the RVQoE report. |

**Question 4**: **Do companies agree to revise the RAN2#123 agreement as below?**

**For container-based QoE, if UL traffic arrives and the UE cannot send the QoE report because the configured SRB is not available, UE continues to store the report until the SRB is available or the QoE configuration is released. (i.e., the QoE report storage is not applied to RVQoE.)**

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| Answers to Question 4 | | |
| Company | Yes/No | Technical Arguments |
| NEC | Yes |  |
| ZTE |  | It is naturally that latest agreements overwrite the previous ones. So it seems no need to revise anything, but we are fine to have it if majorities are fine with it. |
| Huawei, HiSilicon | Yes | To our understanding, the above RAN2#123bis agreement is only for the handling of RVQoE report, and the above RAN2#123 agreement should be only for container-based QoE report. It is OK to do so.  We also think we should clarify that RVQoE reports are discarded and not stored and reported later. Current agreement leaves freedom to the UE, but the problem is that such delayed RVQoE reports may only confuse the gNB as they will be outdated when reported. |
| Qualcomm | Yes |  |
| Ericsson | Yes | Change container-based to encapsulated. |
| Nokia | Yes | We are fine to clarify whether the RVQoE reports should be discarded as commented by Huawei. |
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**Summary 4**: 5 companies agree to revise the RAN2#123 agreement to specify that only the encapsulated QoE report can be stored. 1 company (ZTE) agree to follow majority view. Huawei commented that, when UE cannot send RVQoE report, it should be further clarified whether the RVQoE report should be discarded and not stored and reported later.

**Proposal 2a: The RAN2#123 agreement *“if UL traffic arrives and the UE cannot send a QoE report because the configured SRB is not available, UE continues to store the report until the SRB is available or the QoE configuration is released”* is applicable only to encapsulated QoE (i.e., the QoE report storage is not applied to RVQoE).**

**Proposal 2b: When UE cannot send RVQoE report because the configured RVQoE specific SRB is not available, RAN2 to further clarify whether the RVQoE report should be discarded and not stored and reported later.**

When SN is released, it was agreed in RAN2-123 meeting that UE is indicated which QoE configurations should be released or kept. However, RAN3 agreed that, at SN release all the QoE measurements configured by the SN should be released. It seems RAN2 agreement is not aligned with RAN3 agreement. Therefore, RAN2 may need to discuss whether previous RAN2 should be revisited to align with RAN3.

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| **RAN2-123 Agreement:**  When SN is released, UE is indicated which QoE configurations should be released or kept. For released configurations, UE indicates the release to upper layers (as in Rel-17)  **RAN3 agreement in [4]**  For NR-DC  - Release all SN configured QoE measurements during SN release |

**Question 5**: **Do companies agree that, when SN is released, all the QoE measurements configured by the SN should be released (i.e., there is no need to indicate to UE which QoE configurations should be released or kept)?**

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| Answers to Question 5 | | |
| Company | Yes/No | Technical Arguments |
| NEC | Yes | We are fine to align with RAN3 agreement to release all SN configured QoE measurements during SN release. |
| ZTE | Yes | We are fine to align RAN3 |
| Huawei, HiSilicon | Yes | We should align with RAN3 agreements. Previous RAN2 agreement would require RAN3 work while they do not intend to do it, as can be seen from their latest agreement.  From UE’s point of view, the UE can know which QOE configurations come from SN as they will be provided via RRCReconfiguration sent by SN. In this case, we think the solution mentioned in Q5 can work. |
| Qualcomm | See comment | In this case, if MN configured QoE is configured to be reported over SRB5, then what UE should do, UE should report over SRB4 autonomously? |
| Ericsson | Yes | We should align with the RAN3 agreement. For the case mentioned by QC, the MN needs to reconfigure the reporting to SRB4, i.e. we can rely on network implementation. |
| Nokia | Yes | On how to treat the unsent QoE report by UE during SN release as mentioned by QC, we think whether the reporting can be sent over SRB4 should be configured by network. It can be further discussed on how to treat the report if the reporting leg is not switched to SRB4. |
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**Summary 5**: 5 companies agree to align with RAN3 agreement to release all SN configured QoE measurements during SN release. 1 company (Qualcomm) commented it should be further clarified how to treat the unsent QoE report (configured to be reported over SRB5) during SN release.

**Proposal 3a: When SN is released, all the QoE measurements configured by the SN should be released (i.e., there is no need to indicate to UE which QoE configurations should be released or kept).**

**Proposal 3b: When SN is released, FFS how to treat the unsent QoE report configured to be reported over SRB5.**

**Question 6**: **Does company have any further open issues? If so, please provide feedback.**

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No further open issue was raised by companies to support QoE in NR-DC.

# 4 Conclusion

Based on the email discussion, we proposed the following:

**For easy agreement:**

**Proposal 1**: **For QoE reporting configured to be reported via SRB5, when SCG is deactivated, it is NW implementation to map SRB5 to MN, release the corresponding QoE configurations or pause the QoE reporting**.

**Proposal 2a: The RAN2#123 agreement *“if UL traffic arrives and the UE cannot send a QoE report because the configured SRB is not available, UE continues to store the report until the SRB is available or the QoE configuration is released”* is applicable only to encapsulated QoE (i.e., the QoE report storage is not applied to RVQoE).**

**Proposal 3a: When SN is released, all the QoE measurements configured by the SN should be released (i.e., there is no need to indicate to UE which QoE configurations should be released or kept).**

**Remaining open issues to be discussed in next meeting:**

**Proposal 2b: When UE cannot send RVQoE report because the configured RVQoE specific SRB is not available, RAN2 to further clarify whether the RVQoE report should be discarded and not stored and reported later.**

**Proposal 3b: When SN is released, FFS how to treat the unsent QoE report configured to be reported over SRB5.**

# 5 Reference

[1] R2-2310204 [Post123][QoE] Remaining Open Issues (China Unicom)

[2] R3-235745 (TP for QoE BL CR for TS 37.340) The QMC support in NR-DC

[3] R2-2310202 Discussion on QoE configuration and reporting for NR-DC, China Unicom

[4] R3-235912 Reply LS on Priority information and NR-DC