3GPP TSG-RAN WG2 Meeting #111-e draft\_R2-2008232

Online, 17th – 28th August 2020

**Agenda item: 4.2**

**Source: Huawei (offline email discussion rapporteur)**

**Title: Report of [AT111-e][402][NB-IoT/eMTC R15] UP EDT for DRB using RLC AM (Huawei)**

**Document for: Report**

# 1 Introduction

This document is the report of the following e-mail discussion:

* [AT111-e][402][NB-IoT/eMTC R15] UP EDT for DRB using RLC AM (Huawei)

Status: Started

      Scope: Progress the discussion and formulate the common understanding.

      Intended outcome: Report from the discussion in R2-2008232

      Deadline: Tuesday 25 1100 UTC.

# 2 Discussion

The document below was discussed online with the following comments:

[R2-2007327](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007327.zip) Discussion of UP EDT for DRB using RLC AM Huawei, HiSilicon discussion Rel-15 NB\_IOTenh2-Core, LTE\_eMTC4-Core

* Ericsson wonders what HW has observed in IODT. HW explains that UL grant is given for the UE to provide the report. The other case is sending the poll bit witn no UL grant.
* Ericsson asks whether the default configuration for PUCCH/PUSCH would still be used for such transnmission. HW thinks that would only be for Msg3.
* QC thinks this may be addressed by stating that UE should not be polled in Msg4 when RRC connection is released.

It was agreed to have an e-mail discussion to progress and formulate a common understanding.

Proposals 1 – 7 hereafter are based on the proposals in the above document.

**Proposal 1: The poll bit shall not be set in the RLC PDU carrying RRCConnectionRelease message for UP-EDT.**

**Company views**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree**  **(yes/no)** | **Comments** |
| Qualcomm | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Sequans | Yes |  |
| ZTE | Yes |  |
| Ericsson | No | We do not want to add restrictions on existing functionality. In our understanding the NW implementation would not typically poll in this case. However, if eNB would include the poll bit, a proper implementation should ensure the polling would work e.g. by including an UL grant.  The following is noted in TS 36.331:  NOTE 2: Until successful connection resumption, the default physical layer configuration and the default MAC Main configuration are applied for the transmission of SRB0 and SRB1, and SRB1 is used only for the transfer of *RRCConnectionResume* message, and *RRCConnectionRelease* message if security has been re-activated.  According to how UP-EDT is specified, "successful connection resumption" has not happened and therefore we think the default configuration (e.g. for PUSCH) applies at this stage, i.e. before *RRCConnectionRelease* is fully processed. |
| Nokia | No | In this case, network implementation can take care of not setting the poll bit |

Conclusion:

Four companies support the proposal. Two companies do not want to put restriction on the functionality.

**Proposal 1**: **RAN2 to discuss further the setting of the** **poll bit in the RLC PDU carrying RRCConnectionRelease message for UP-EDT and whether the eNB can request the UE to send a RLC STATUS/**

**Proposal 2: A positive HARQ feedback (HARQ ACK) is an implicit RLC ACK of all the RLC PDUs included in the UP-EDT DL transmission**

**Company views**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree**  **(yes/no)** | **Comments** |
| Qualcomm | Yes |  |
| Huawei, HiSilicon | Yes |  |
| Sequans | Yes |  |
| ZTE | Yes |  |
| Ericsson | Depends on whether poll bit is included | If the eNB does not include the poll bit, then it should be clear and HARQ ACK would act as a trigger to finish the EDT procedure.  If UE is polled, then UE should reply with RLC STATUS in uplink. |

**Conclusion**:

Four companies support the proposal. One company indicates it depends on whether the poll bit is set.

**Proposal 2**: **A positive HARQ feedback (HARQ ACK) is an implicit RLC ACK of all the RLC PDUs included in the UP-EDT DL transmission.**

**Proposal 3: Follow the legacy RLC procedure for poll bit setting in the RLC PDU(s) carrying the UL user data for UP-EDT.**

**Company views**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree**  **(yes/no)** | **Comments** |
| Qualcomm | Yes with revised proposal. | Existing procedures for setting POLL bit in plink RLC PDU shall be follows. |
| Huawei, HiSilicon | Yes | Fine with the revision |
| Sequans | Yes | Revision is fine |
| ZTE | No | Even we think data reliability is important, we still think it’s not so necessary to set POLL bit for UL data for EDT or PUR. This may be a little different from the DL transmission.  For UL transmission, if Msg3/UL data is not received successfully, retransmission should be triggered instead of sending MSG4. UE can assume that reception of *RRCConnectionRelease* is an implicit RLC ACK of all the RLC PDUs included in the UL transmission. |
| Ericsson | Yes | This is according to the existing specifications and therefore there doesn't seem to be anything additional what needs to be done.  It is possible to use RLC AM with UP EDT and we don't see this should be changed. |

Conclusion:

Four companies support the proposal. One company thinks it is not necessary and that reception of RRCConnectionRelease can be an implicit ACK.

**Proposal 3**: **Follow the legacy RLC procedure for poll bit setting in the RLC PDU(s) carrying the UL user data for UP-EDT.**

**Proposal 4: The poll bit shall be set in the RLC PDU(s) carrying the UL user data for UP-EDT.**

**Company views**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree**  **(yes/no)** | **Comments** |
| Qualcomm | No | This contradicts Proposal 2.  In any case, as UE does not have PUSCH configuration then UE can not send RLS STATUS message if polled by any of the RLC PDUs in MSG4. |
| Huawei, HiSilicon | Yes. |  |
| Sequans | Yes |  |
| ZTE | No |  |
| Ericsson | Yes (assuming RLC conditions are fulfilled) | The specification says that poll bit shall be included e.g. when the transmission buffer on the transmitting side of AM RLC entity becomes empty or if no new RLC data PDU can be transmitted – e.g. in the case of UP-EDT when all data fit – therefore this is according to existing specification under the proper conditions and there isn't need to do anything else. |

Conclusion:

The question was corrected wrongly to apply to the UL, which was the same as proposal 3. Thus it is proposed to carry on discussing

**Proposal 4**: **RAN2** **to discuss whether to follow** **the legacy RLC procedure for poll bit setting in the RLC PDU(s) carrying the DL user data for UP-EDT.**

**Proposal 5: A RLC STATUS PDU is included in MSG4 (carrying RRCConnectionRelease) for each POLL in RLC PDU included in the uplink transmission.**

**Company views**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree**  **(yes/no)** | **Comments** |
| Qualcomm | Yes with the modified proposal. | eNB only required to send RLC STATU PDU if UE polled the eNB, otherwise it is not necessary for eNB to send RLC STATUS PDU. |
| Huawei, HiSilicon | Yes | We are fine with the rewording. we assume this covers the case where two RLC PDUs for the same DRBs are included in the UL transmission |
| Sequans | Yes | Revision is fine |
| ZTE | No |  |
| Ericsson | No | It is very likely that a NW implementation would include the RLC STATUS in Msg4 if the intention is to release the UE back to Idle after EDT.  We don't see a need to change the legacy conditions or operation regarding this. |
| Nokia | No | Proposal is fine. But it does not require any change in specification. It is upto network to handle this situation. |

Conclusion:

Three companies support the proposal. Three companies do not support the proposal, two of them indicating that it is up to the network and there is no need to change the legacy operations

**Proposal 5**: **RAN2 to discuss further whether to follow** **the legacy RLC procedure for the inclusion of RLC STATUS PDU in MSG4 (carrying RRCConnectionRelease) for each POLL in RLC PDU included in the uplink transmission.**

**Proposal 6: Proposals 1..3 also apply to MT-EDT.**

**Company views**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree**  **(yes/no)** | **Comments** |
| Qualcomm | Yes with the modified proposals. |  |
| Huawei, HiSilicon | Yes |  |
| Sequans | Yes |  |
| ZTE | No | Only proposals 1..2 can apply to MT-EDT |

Conclusion:

Three companies support the proposal, one company indicate that proposal 3 does not apply to MT-EDT (which is correct).

Actually only proposal 1 and 4 apply to MT-EDT

**Proposal 6**: **MT-EDT follows the same rules as MO-EDT w.r.t the DL user data transmission.**

**Proposal 7: Proposals 1..5 also apply to PUR.**

**Company views**

|  |  |  |
| --- | --- | --- |
| **Company** | **do you agree**  **(yes/no)** | **Comments** |
| Qualcomm | Yes with the modified proposals. |  |
| Huawei, HiSilicon | Yes |  |
| Sequans | Yes |  |
| ZTE | No | Only proposals 1..2 can apply to PUR. |

Conclusion:

Three companies support the proposal, one company indicate that only proposal 1 and 2 apply to PUR,

**Proposal 7**: **PUR follows the same rules as MO-EDT.**

**Proposal 8: Do you think clarifications in the specifications are needed.**

**Company views**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Qualcomm | Clarification in section 5.2.2 of TS 36.322 would be useful for proper eNB implementation. Perhaps following note can be added in section 5.2.2.  Note: UE is unable to respond to a poll received in MAC PDU containing *RRCConnectionRelease* message during UP-EDT or UP-PUR, see TS 36.331 [5] clause 5.3.3.1. |
| Huawei, HiSilicon | We think that clarification is needed for proposals 1 and 2. For the other proposals, this follows the legacy behaviour.  As proposals 1 and 2 are related to to eNB behaviour, we think this can be clarified in stage 2. |
| Sequans | Yes, for proposals 1,2. We are not quite sure how to capture yet – First, these are not stage 2 details, so we would prefer to capture in stage 3 spec. In addition, the use of shall suggests we should not use a note, but on the other hand we find no natural place for these assertions.  We agree proposal 4 follows from legacy procedure but it would be good to capture e.g. in a note. |
| ZTE | For proposal 1 and 2, we are fine with a Note in TS 36.322, maybe as proposed by QC. |
| Ericsson | We do not think any stage-3 changes should be made and would not clarify as an essential correction. |

Conclusion:

Three companies think clarification are needed in TS 36.322, one company thinks that clarification in stage 3 is not needed. One company thinks we could have a clarification in stage 2.

**Proposal 8**: **After agreeing the expected behaviour, RAN2 to discuss whether specification updates are needed.**

**Other comments.**

|  |  |
| --- | --- |
| **Company** | **Comments** |
| Huawei, HiSilicon | We think it could be useful to clarify in the chair’s notes that if a RLC ACK for the DL data is is needed, the UE should be moved to RRC\_CONNECTED |
| Sequans | w.r.t HW’s comment: It seems to follow from proposal 1, but it could be good to clarify in the chair notes. It also depends on how we actually capture proposal 1 |
| ZTE | Proposal 1 and 2 are enough, other things can be left to eNB implementation and no need to explicitly mention. |

Conclusion:

**Proposal 9**: **After agreeing the expected behaviour, RAN2 to discuss whether anything needs to be captured in the chair’s notes.**

# 3 Summary

Six companies (Qualcomm, Huawei, Sequans, ZTE, Ericsson, Nokia) contributed to the e-mail discussion:

**Potential agreements (all companies but one):**

**Proposal 2**: **A positive HARQ feedback (HARQ ACK) is an implicit RLC ACK of all the RLC PDUs included in the UP-EDT DL transmission.**

**Proposal 3**: **Follow the legacy RLC procedure for poll bit setting in the RLC PDU(s) carrying the UL user data for UP-EDT.**

**Proposal 6**: **MT-EDT follows the same rules as MO-EDT w.r.t the DL user data transmission.**

**Proposal 7**: **PUR follows the same rules as MO-EDT.**

**For further discussion**

**Proposal 1**: **RAN2 to discuss further the setting of the** **poll bit in the RLC PDU carrying RRCConnectionRelease message for UP-EDT and whether the eNB can request the UE to send a RLC STATUS.**

**Proposal 4**: **RAN2** **to discuss further whether to follow** **the legacy RLC procedure for poll bit setting in the RLC PDU(s) carrying the DL user data for UP-EDT.**

**Proposal 5**: **RAN2 to discuss further whether to follow** **the legacy RLC procedure for the inclusion of RLC STATUS PDU in MSG4 (carrying RRCConnectionRelease) for each POLL in RLC PDU included in the uplink transmission.**

**Proposal 8**: **After agreeing the expected behaviour, RAN2 to discuss whether specification updates are needed..**

**Proposal 9**: **After agreeing the expected behaviour, RAN2 to discuss whether anything needs to be captured in the chair’s notes.**

# 4 List of referenced documents

# 5 Participants

|  |  |  |
| --- | --- | --- |
| **Company** | **Name** | **e-mail address** |
| Qualcomm | Mungal | mdhanda@qti.qualcomm.com |
| Sequans | Noam | noam.cayron@sequans.com |
| ZTE | Ting | [lu.ting@zte.com.cn](mailto:lu.ting@zte.com.cn) |
| Ericsson | Tuomas | tuomas.tirronen@ericsson.com |