3GPP TSG-RAN WG2 Meeting #112-e R2-200xxxx

Online, 2nd - 13th November 2020

**Agenda item: 4.2**

**Source: Huawei**

**Title: Draft summary of [AT112-e][401][NB-IoT/eMTC R15] UP EDT for DRB using RLC AM (Huawei)**

**Document for: Report**

# 1 Scope of the offline discussion

This is the offline email discussion “[AT112-e][401][NB-IoT/eMTC R15] UP EDT for DRB using RLC AM”, as indicated below:

* [AT112-e][401][NB-IoT/eMTC R15] UP EDT for DRB using RLC AM (Huawei)

Status: Started

Scope: Discuss how to capture the agreement on how the procedure ends at the UE for MO-EDT, MT-EDT or PUR in the specifications.

Intended outcome: Agreed 36.300 and 36.331 CRs in R2-2010810, R2-2010811, R2-2010812, and R2-2010813

Deadline: Tuesday 2020-11-10 14:00 UTC

# 2 Offline discussion

The summary of offline discussion [Post111-e][922][NB-IoT/eMTC R15] UP EDT for DRB using RLC AM (Huawei) [1] was discussed and the following agreeement was made:

* For MO-EDT, MT-EDT or PUR, the procedure ends at the UE with the transmission of HARQ ACK for Msg4, i.e., without responding to the poll bit, if any, or waiting for 1.25sec/10 sec. FFS how to capture this in the specifications.

This offline discussion is to discuss and agree on what and how to capture in the specification.

In [1], it was proposed to capture the above as follows:

* Proposal 5: Capture in stage 2 that the EDT procedure terminates with the transmission of HARQ ACK for MSG4 which is an implicit acknowledgment of the successful delivery of the DL data. ([2])
* Proposal 6: Capture in RRC specification, that upon reception of RRCConnectionRelease for EDT, the UE can proceed without delay with the release of the resources, regardless of any poll bit. ([4])

**Proposal 1**: Capture in stage 2 that, for MO-EDT, MT-EDT and PUR, the EDT procedure ends with the transmission of HARQ ACK for MSG4 which is an implicit acknowledgment of the successful delivery of the DL data

Companies to provide their views on the proposal and provide details on the required changes as needed.

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| **Company** | **Do you agree?**  **Yes/No** | **Comments** |
| Huawei, Hisilicon | yes | We need to capture in stage 2 how the procedure is working and that it ends with transmission of the HARQ ACK by the UE. We also need to indicate that the HARQ ACK acts as an implicit acknowledgment of the successful delivery of the DL data. this is needed to report successful data delivery for non-IP service.  We can fine with the change proposed in ([2]) |
| Nokia | Yes | *The reception of a positive layer 1 feedback from the UE is the acknowledgement of the successful DL data transmission. The procedure ends. To be changed as …*  *If the downlink data multiplexed with RRC connection, the procedure ends at ENB on reception of positive ack from layer-1.*  Above is needed irrespective of whether included PDU is from RLC-AM or RLC-UM. |
| MediaTek | Yes | *Agree with Nokia’s wording.* |
| Qualcomm | Yes | To be aligned with (anticipated) stage 3 it is better to clarify from UE perspective as follows:  8. The eNB sends the *RRCConnectionRelease* message to keep the UE in RRC\_IDLE. The message includes the *releaseCause* set to *rrc-Suspend*, the *resumeID,* the *NextHopChainingCount* and *drb-ContinueROHC* which are stored by the UE. If downlink data were received in step 6, they are sent ciphered on DTCH multiplexed with the *RRCConnectionRelease* message on DCCH. Upon transmission of HARQ acknowledging the reception of DL MAC PDU, the procedure ends.  In addition to the above, we think it makes sense to have a note in stage 2 to recommend eNB to not poll the UE as proposed below:  NOTE 1: If the MME or eNB decides the UE to move in RRC\_CONNECTED mode, *RRCConnectionResume* message is sent in step 7 to fall back to the RRC Connection resume procedure. In that case, the *RRCConnectionResume* message is integrity protected and ciphered with the keys derived in step 1 and the UE ignores the *NextHopChainingCount* included in the *RRCConnectionResume* message. Downlink data can be transmitted on DTCH multiplexed with the *RRCConnectionResume* message. In addition, an *RRCConnectionSetup* can also be sent in step 7 to fall back to the RRC Connection establishment procedure.  NOTE 2: If neither *RRCConnectionRelease* nor, in case of fallback, *RRCConnectionResume* is received in response to *RRCConnectionResumeRequest* for EDT,the UE considers the UL data transmission not successful.  NOTE x: The eNB should not poll the UE in any of the RLC PDUs transmitted in DL MAC PDU containing *RRCConnectionRelease* message in step 8. |
| ZTE | Yes | We are fine with the above two stage-2 changes proposed by QC. |
| Ericsson | Yes | Agree with the intention to capture in stage-2. We suggest the following wording:  “If downlink data are received on DTCH multiplexed with the *RRCConnectionRelease* message, reception of positive HARQ feedback (ACK) acknowledges successful DL data transmission.”  There is no need to mention end of procedure, and such expressions are not found elsewhere in stage-2. The meaning of such expression is not defined.  The Note proposed by QC above is not needed. |

Conclusion:

All companies agree with a stage 2 clarification.

All companies but one propose to clarify that the procedure ends with the positive HARQ ACK. The other company indicates that we don’t use such expression normally.

There are many different wording proposals. Several companies indicate that the HARQ ACK only acknowledges the successful data delivery if some were multiplexed with RRCConnectionRelease

Two companies proposed to add a note that the eNB should not poll the UE in any RLC PDU included in MSG4.

**Proposal 1**: Agree on a stage CR that clarifies that the procedure ends with the positive HARQ ACK which is also an acknowledgement of the succesful delivery of the downlink data, if any, multiplexed with RRCConnectionRelease message .

**Proposal 2:** Continue discussing the actual wording based the following proposal from the rapporteur

“The procedure ends with the reception of the layer 1 ACK acknowledging the successful DL transmission”.

**Proposal 2**: Capture in RRC specification, that upon reception of RRCConnectionRelease for EDT, the UE proceeds without delay with the release of the resources (i.e, regardless of any poll bit).

Companies to provide their views on the proposal and provide details on the required changes as needed.

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| **Company** | **Do you agree?**  **Yes/No** | **Comments** |
| Huawei, HiSilicon | yes with the intent | We need to specify in stage 3 that the UE proceeds with the release of the connection immediately after the transmission of the HARQ.  We think it can be done in two ways:   1. Specify as in [4] that the UE proceeds immediately upon reception of the RRCConnectionRelease message for EDT, i.e. the UE ignores the poll bit. 2. Specify that the eNB does not set the poll bit in the RRCConnectionRelease message for EDT. In that case, the UE follows the existing text for quick RRC connection release.   We have a preference for option 2 as it does not change the UE behaviour. Maybe be it could be clarified in the existing NOTE.  For BL UEs, Ues in CE and NB-IoT, when STATUS reporting, as defined in TS 36.322 [7], has not been triggered and the UE has sent positive HARQ feedback (ACK), as defined in TS 36.321 [6], the lower layers can be considered to have indicated that the receipt of the *RRCConnectionRelease* message has been successfully acknowledged. STATUS reporting is not triggered with *RRCConnectionRelease* in response to *RRCConnectionResumeRequest* for EDT. |
| Nokia | No | Stage-2 clarification is sufficient. For option1 indicated above, specification changes are not needed.. because when RRC layer triggers transition to IDLE state all the lower layers are reset ,so even if the UE have pending RLC status for polling bit, it will also be cancelled. So no explicit specification changes not needed. |
| MediaTek | Yes | We prefer Option 2 which has no UE impact. |
| Qualcomm | No | It was discussed during online that UE will not be mandated to not respond to the poll in EDT message that completes the procedure. Therefore we think clarification in stage 2 as proposed by Qualcomm for Proposal 1 above is sufficent. |
| ZTE | No | Stage-2 clarification is enough. |
| Ericsson | Yes but | We think it would be good to clarify the UE can proceed to release the connection without waiting, thus something like Option 1 in HW’s reply is fine to us. Additionally we may need to mention PUR.  We don’t think there is need to specify eNB behaviour for this case, therefore Option 2 is not acceptable. |

Conclusion:

Three companies think that a stage 2 clarification is sufficient and there is no need for a stage 3 CR.

Three companies support a stage 3 CR but have different opinion on whether to add a new UE requirement.

**Proposal 3:** No stage 3 CR.

Companies to provide their views on whether other changes are required and in which specification(s).

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| **Company** | **Comments** |
| MediaTek | Proposal 2 captures the changes for EDT in stage 3. Do we need stage 3 changes for PUR as well? |
| Qualcomm | We are concerned with RRC starting to curtail RLC procedures for normal cases therefore would like to avoid setting a precedence. |

Conclusion:

# 3 Conclusion

Six companies contributed: Huawei/HiSilicon. Nokia, Mediatek, Qualcomm, ZTE, and Ericsson

Based on the discussion, the following proposal are made:

**Proposal 1**: Agree on a stage 2 CR that clarifies that the procedure ends with the positive HARQ ACK which is also an acknowledgement of the succesful delivery of the downlink data, if any, multiplexed with RRCConnectionRelease message .

**Proposal 2:** Continue discussing the actual wording based the following proposal from the rapporteur

“The procedure ends with the reception of the layer 1 ACK acknowledging the successful DL transmission”.

**Proposal 3:** No stage 3 CR.

# 4 Reference

1. [R2-2009723](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_112-e/Docs/R2-2009723.zip) Report of e-mail discussion [Post111-e][922][NB-IoT/eMTC R15] UP EDT for DRB using RLC AM (Huawei) Huawei, HiSilicon report Rel-15 NB\_IOTenh2-Core, LTE\_eMTC4-Core

1. [R2-2009724](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_112-e/Docs/R2-2009724.zip) Clarification to UP-EDT Huawei, HiSilicon CR Rel-15 36.300 15.11.0 1298 1 F NB\_IOTenh2-Core, LTE\_eMTC4-Core [R2-2007328](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007328.zip)
2. [R2-2009725](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_112-e/Docs/R2-2009725.zip) Clarification to UP-EDT Huawei, HiSilicon CR Rel-16 36.300 16.3.0 1299 1 A NB\_IOTenh2-Core, LTE\_eMTC4-Core [R2-2007329](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_111-e/Docs/R2-2007329.zip)

1. [R2-2009726](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_112-e/Docs/R2-2009726.zip) Clarification to UP-EDT Huawei, HiSilicon CR Rel-15 36.331 15.11.0 4477 - F NB\_IOTenh2-Core, LTE\_eMTC4-Core
2. [R2-2009727](http://ftp.3gpp.org/tsg_ran/WG2_RL2/TSGR2_112-e/Docs/R2-2009727.zip) Clarification to UP-EDT Huawei, HiSilicon CR Rel-16 36.331 16.2.1 4478 - A NB\_IOTenh2-Core, LTE\_eMTC4-Core

# 4 Participants

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| --- | --- | --- |
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