、3GPP TSG-RAN WG2 #116-e R2-21xxxx

Electronic meeting 1st - 12th November, 2021

Agenda Item: 8.1.2

Source: Lenovo, Motorola Mobility

Title: Report of offline discussion: [AT116-e][050][MBS] UP continuation

Document for: Discussion and Decision

# 1 Introduction

In this document the following offline is discussed:

* [AT116-e][050][MBS] UP continuation (Lenovo)

 Scope: Treat remaining less controversial proposals from [R2-2110319](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_116-e/Docs/R2-2110319.zip). Attempt offline agreements

 Intended outcome: Report

 Deadline: Tuesday W2

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# 2 Discussion

## 2.1 MBS DRX related Proposals

In [R2-2110319](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_116-e/Docs/R2-2110319.zip), the following proposals are made for MBS DRX:

**Proposal 25: For how UE monitors UE specific PDCCH/C-RNTI for possible PTP transmission for PTM HARQ retransmission in active time of multicast DRX, RAN2 discusses and selects one of following options:**

**-   Option 2: the UE monitors UE specific PDCCH/C-RNTI only when drx-RetransmissionTimerDLPTM is running. For example, when drx-onDurationTimerPTM and drx-InactivityTimerPTM are running but drx-RetransmissionTimerDLPTM is not running, the UE does not monitor UE specific PDCCH/C-RNTI.**

**-   Option 3: the UE monitors UE specific PDCCH/C-RNTI only during unicast DRX’s active time. Unicast DRX’s RTT timer can be started when PTP retransmission is expected.**

**Proposal 18 (15/24): short DRX cycle is not supported for multicast DRX.**

**Proposal 26: For DRX command MAC CE for multicast DRX, RAN2 discusses and selects one of following solutions:**

**- Option 2b: introduce a new DRX command MAC CE per multicast DRX operation (i.e. per G-RNTI basis)**

**- Option 3: neither legacy DRX command MAC CE nor new DRX command MAC CE is used for multicast DRX, i.e. no DRX command MAC CE for multicast DRX.**

**Proposal 19 (17/23): it is up to network implementation on how to configure DL RTT and Re-transmission timer of multicast DRX in case of multicast HARQ ACK/NACK feedback using UE specific PUCCH resources.**

**Proposal 20 (23/24): For group common PTM Multicast HARQ PUCCH resources (NACK only feedback), the same group of UEs have aligned HRAQ RTT and DL Re-Tx timer configuration. HARQ RTT timer counting starts from end of common PUCCH resource based NACK transmission (i.e. same as Unicast DRX behaviour).**

From rapporteur’s point of view, to follow the majority’s view, the proposal 19 and proposal 20 can be agreed. Considering the time limitation and in order to make progress, rapporteur would suggest to agree the proposal 18 and we can discuss whether short DRX cycle can be introduced in future release.

For proposal 25 and 26, they are more controversial, it would be better to have further discussion before making a decision.

**Q1: If companies do not agree one of the proposal 18, proposal 19 and proposal 20, please provide the comments or alternative proposal below.**

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| **Company** | **Comments** |
| Nokia | Short DRX is useful for Mission Critical services. Not sure why this is excluded as it’s a well-defined mechanism. |
| TD Tech, Chengdu TD Tech | **Proposal 25: we prefer to option 2.** We have a concern on option 3. If option 3 is used different UEs may have different Unicast DRX’s RTT timer. In other word, different UEs may have different values for the unicast DRX’s RTT timer.**Proposal 18 (15/24): Ok. We can accept the proposal.****Proposal 26: We prefer to option 2b. It’s better to support a new DRX command MAC CE per multicast DRX operation.****Proposal 19 (17/23): ok****Proposal 20 (23/24):ok** |
| Samsung | P19/P20Although we prefer to have a common behaviour for all FB options, i.e. ACK/NACK, NACK-only and disabled FB, we are ok with P19/20, since majority wants to go this way. But we think the case of no FB should be discussed. UE can receive HARQ retransmission irrespective of HARQ feedback or no HARQ feedback. RAN1 agreed that HARQ feedback is enabled/disabled per G-RNTI by UE specific configuration and therefore, UE not providing feedback can still avail HARQ retransmissions meant for other UEs (e.g. this is quite useful for an outlier UE or a cell-edge UE to enhance reliability of MBS reception). So we suggest to add FFS for case of disabled HARQ FB to P19/20.**Proposal 19 (17/23): it is up to network implementation on how to configure DL RTT and Re-transmission timer of multicast DRX in case of multicast HARQ ACK/NACK feedback using UE specific PUCCH resources. FFS for case of disabled HARQ FB****Proposal 20 (23/24): For group common PTM Multicast HARQ PUCCH resources (NACK only feedback), the same group of UEs have aligned HRAQ RTT and DL Re-Tx timer configuration. HARQ RTT timer counting starts from end of common PUCCH resource based NACK transmission (i.e. same as Unicast DRX behaviour). FFS for case of disabled HARQ FB****P25: prefer Option 3 (same as the previous discussion)****P26: prefer Option 3 (same as the previous discussion)** |
| Qualcomm | **For P25:**Both option 2 and 3 will work. With option 2, UE is required to monitor both Multicast CSS/G-RNTI and legacy UE specific SS/C-RNTI during DL PTM HARQ Re-Transmission timer. No need for UE to maintain two sets of timers associated with Multicast DRX. (Set1 timers: PTM RTT Timer, PTM Re-Tx timer , Set2 timers: PTP RTT timer, PTP Re-Tx timer). With option 3, UE is required to maintain 2 sets of timers associated with Multicast DRX. This allows more flexibility for GNB to configure different timer values and scheduling flexibility for unicast Re-Tx. There are pros and cons for both options. From UE’s timer maintenance point of view Option 2 is simpler than option 3. We have slight preference to Option 2 over Option 3.**For P18:** We agree with Nokia comment above. Short DRX is optional anyway and frame already supported by legacy unicast DRX and same can be extended for Multicast DRX. This is very useful for applications like MCPTT. If not supported by R17 UEs and introduced in R18 then this causes fragmentation of UEs supporting short DRX and when a future release gNB capable of short DRX, it can’t make use of short DRX due to R17 UEs not supporting short DRX. So, we strongly suggest to introduce short DRX in R17 itself. **For P26:****We support Option 2b,** whichwill help UEs to further reduce power consumption due to UEs are not required to monitor additional Multicast CSS/G-RNTI, reduces number of blind decodes. Another key question is whether to use common DRX command MAC-CE for all PTM DRX configurations or not?. In our view, different PTM DRX patterns are associated with different MBS traffic patterns. It is not optimal to use common MAC-CE for all DRX patterns and to provide flexibility, we suggest to adopt each Multicast DRX command MAC-CE to be associated with a specific PTM DRX configuration.**For P19:**We prefer to UE to start PTM RTT timer upon receiving GC-PDCCH/GC-PDSCH instead of leaving timer configuration to NW implementation to avoid configuration errors. **For P20:** Ok,but if we wanted to have common behaviour for starting PTM RTT timer, we can follow PTM RTT timer starting at reception of GC-PDCCH/GC-PDSCH. |
| Apple | Proposal 18: SupportThe short DRX cycle is designed for the transmission of the potential quick feedback which is triggered by the transmission in the long DRX cycle. Since the multicast PTM transmission is the DL only transmission, it seems no need to introduce the short DRX cycle configuration for PTM. Even for the MCPTT service, if there is any emergency feedback, it can be delivered via the PTP/unicast link. Proposal 19,20: SupportWe propose the unified DRX RTT scheme for PTM and PTP. Proposal 25: Prefer Option 2***Option 2: the UE monitors UE specific PDCCH/C-RNTI only when drx-RetransmissionTimerDLPTM is running. For example, when drx-onDurationTimerPTM and drx-InactivityTimerPTM are running but drx-RetransmissionTimerDLPTM is not running, the UE does not monitor UE specific PDCCH/C-RNTI.***According to the DRX active time concept, UE shall monitor all the PDCCH scheduling for the PTM HARQ (re)transmission during the PTM DRX active time, which includes the PDCCH/C-RNTI scheduled PTM retransmission during the drx-RetransmissionTimerDLPTM. Proposal 26: Prefer Option 2***Option 2b: introduce a new DRX command MAC CE per multicast DRX operation (i.e. per G-RNTI basis)***The DRX MAC CE is for UE power saving purpose and applicable in the scenario when the UE is in active time but there is no more data for transmission. Since the NW cannot provide the DRX configuration accurately matching the traffic pattern, the purpose and the scenario of the DRX MAC CE are also applicable for the PTM transmission.  |
| Xiaomi | For Proposal 25, we slightly prefer Option 3, as Option 3 which keeps the unicast PDCCH monitoring only during the running period of the unicast DRX timer is simpler from the MAC.For Proposal 26, we prefer Option 2b, as this can support the temporary suspension of the MBS service. In the LTE MBMS, we also support the suspension of the MBMS service via the “Extended MCH Scheduling Information” MAC CE.For Proposal 17, we would like to clarify that no extra enhancement is needed. For example, when the network does not configure the multicast DRX timer, but configures the HARQ feedback, then the PDCCH monitoring behaviour should be as the timer is not configured. |
| MediaTek | **Proposal 18:** Agree with Nokia. Short DRX is useful for some cases and we cannot ensure the traffic characteristic is always predictable in multicast service. So short DRX could better be optional and left to NW implementation.**Proposal 19: Ok****Proposal 20: Ok** |
| CATT | Agree with P18,P19,P20.Not sure whether we are discussing P25 and P26.our views on them have not changed, so,P25: option 2 is preferred.P26: option 3 is preferred. |
| CMCC | Proposal 25: Prefer Option 2With Option 2, UE monitors UE specific PDCCH/C-RNTI and multicast PDCCH/G-RNTIs only when drx-RetransmissionTimerDLPTM is running, which is simpler than Option 3.Proposal 18: OpenWe are open to this issue, short DRX could be supported if such MBS traffic pattern needed. We can consult with other WGs.Proposal 26: Prefer Option 3Proposal 19/20: OK |
| Ericsson | P18 (Short DRX): As this is already optional and based on existing functionality we think this can also be supported for Multicast DRX.P25 (monitoring of PDCCH): Support Option 2 as this aligns with monitoring PDCCH scheduling of (re)transmissions during PTM DRX active time (G-RNTI and C-RNTI)P26 (DRX command MAC CE): Prefer a per PTM configuration DRX Command MAC CE as this can give better DRX control per service configured on PTM. |
| vivo | We are fine with P18, P19, and P20. For P25, we prefer the option2 as it is aligned with RAN1’s intention on L1 PTP HARQ retransmission for the L2 PTM leg and helps to facilitate the NW scheduling. From UE perspective, additionally monitoring PDCCH addressed to C-RNTI with PDCCH addressed to G-RNTI during the running period of DRX retransmission timer will not cost much UE power, can be acceptable, as retransmission is generally not so frequent.For P26, it seems a spontaneous logic to follow option2b as the DRX for multicast PTM per G-RNTI basis. We can also follow option 3 if it is the majority view.  |
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## 2.2 PDCP/RLC configuration for broadcast

In [R2-2110319](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_116-e/Docs/R2-2110319.zip), the following proposals are made for PDCP/RLC configuration for broadcast:

**Proposal 21: for broadcast MRB, the *sn-FieldLength* (for RLC) and *pdcp-SN-SizeDL* parameters are predefined with configuration optionally provided.**

**Proposal 22: for broadcast MRB, the t-Reassembly (in RLC configuration) are predefined with configuration optionally provided. FFS on t-Reordering (in PDCP configuration).**

**Proposal 23: for broadcast MRB, when enabled by the network, RoHC parameters are predefined with configuration optionally provided.**

Rapporteur thinks all the proposals are not controversial and can be agreed.

**Q2: If companies do not agree one of the proposal 21, proposal 22 and proposal 23, please provide the comments or alternative proposal below.**

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| **Company** | **Comments** |
| MediaTek | **Proposal 22:** It should be noted that although retransmission is not supported in L1/L2 in R17 broadcast, we still need to discuss the t-Reordering configuration since it is a part of receive operation in PDCP (unless *outOfOrderDelivery* is configured).  |
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# 3 Concussion

 [TBD]

# References

1. [R2-2110319](https://www.3gpp.org/ftp/tsg_ran/WG2_RL2/TSGR2_116-e/Docs/R2-2110319.zip) [Post115-e][092][MBS] Remaining User plane issues (Lenovo) Lenovo, Motorola Mobility