3GPP TSG-RAN WG3 Meeting #120 R3-233321

**Incheon, Korea, 22nd – 26th May 2023**

**Agenda Item: 9.2.2**

**Source: Ericsson**

**Title: Summary of offline discussions for CB:#9\_InitialRX-DELIV**

**Document for: Discussion**

# 1 Introduction

**CB: # 9\_** **InitialRX-DELIV**

**- Clarify on the details of the solutions and compare the solutions with pros and cons if possible**

**- Capture agreements if any, and whether send LS to other WGs is needed?**

(moderator - E///)

Summary of offline disc [R3-233321](file:///C:\\Users\\w00364378\\Downloads\\Inbox\\R3-233321.zip)

# 3 Proposal for chair minutes

No consensus to follow any of the proposed solutions for Rel-17. Discussion closed for Rel-17.

# 2 Discussion

## 2.1 Tuesday afternoon coffee-break discussion on clarifying “solutions/approaches”

### 2.1.0 General

The discussion is related to derivation of PDCP SNs based on DL MBS QFI SNs sent via NG-U and the unavailability of DL MBS QFI SN for the QoS flows mapped to an MRB at RRC configuration of a UE with that MRB.

### 2.1.1 NG-U approach

As of [R3-232697](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_120/Docs/R3-232697.zip)/[2698](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_120/Docs/R3-232698.zip).

Next DL MBS QFI SNs are provided per QoS flow via “empty payload NG-U packets” containing next DL MBS QFI SN.

- for multicast transport, the “empty payload NG-U packets” would be received by all gNBs that joined the multicast (transport) group.

### 2.1.2 NG-C approach

As of [R3-232862](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_120/Docs/R3-232862.zip)/[2863](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_120/Docs/R3-232863.zip).

Next DL MBS QFI SNs are provided per QoS flow via NGAP: DISTRIBUTION SETUP RESPONSE message during the establishment of shared NG-U.

### 2.1.3 NG-RAN internal CP approach

As of [R3-232884](https://www.3gpp.org/ftp/tsg_ran/WG3_Iu/TSGR3_120/Docs/R3-232884.zip).

UEs are configured with MRBs which PDCP entities are initialised with locally decided intialRX-DELIV values (e.g. 0) and these UEs are receiving multicast data with PDCP SNs which are derived based on the locally decided initialisation.

When the gNB becomes aware of received data, it retrieves the current values based on DL MBS QFI SNs and establishes another set of MRBs and initializes the PDCP entities along the retrieved initialisation information. Newly joining or handed-over UEs can be configured with this new set of MRBs from now on.

All UEs configured with the old set of MRBs are re-configured, one-by-one, with the new set of MRBs (release and add, so a UE is never configured with both sets of MRBs).

- It was commented that this would require temporary allocation of an additional set of MRBs/MBS resources and minimisation of data loss and packet duplication at release-add of old/new MRBs cannot be guaranteed.

### 2.1.4 Configure UEs with initialRX-DELIV=0 and trigger PDCP re-establishment with actual initialRX-DELIV

As of discussions during offline discussions a further possible approach was developed

- if initialRX-DELIV is not available UEs are configured with initialRX-DELIV == 0

- When the first packet arrives with a PDCP SN not sync’d to the UEs’ initialisation (HFN in UEs set to 0), UE would wait for expiry of *t-Reordering* (if applicable) and provide PDCP SDUs to upper layers as of 38.323.

- network would trigger PDCP re-establishment of the MRBs’ PDCP entities providing an intiialRX-DELIV derived from the DL MBS QFI SNs received over NG-U.

- This approach would not require the establishment of a second set of MRBs on the network side.

### 2.1.5 Do nothing

UEs can be only configured with MRBs once the DL MBS QFI SNs of the QoS flows mapped to the MRBs are available at the gNB.

- This creates delay and may create data loss for reception of multicast data, but ensures the possibility of applying schemes for minimisation of data loss and avoid duplications once the UE is configured.

- Data loss may be avoided by buffering multicast data received via NG-U.

# 5 References

[1] R3-232697 "Correction of MBS multicast HFN SN Initialisation" (Nokia, Nokia Shanghai Bell, CATT, Orange, Qualcomm Incorporated) discussion

[2] R3-232698 "Correction of MBS multicast HFN SN Initialisation" (Nokia, Nokia Shanghai Bell, CATT, Orange, Qualcomm Incorporated) CR 38.401 Rel-17

[3] R3-232699 "LS on Multicast HFN/SN Initialization for Inactive Multicast Sessions" (Nokia, Nokia Shanghai Bell, CATT, Orange, Qualcomm Incorporated) LS out

[4] R3-232700 "Correction of Multicast Supporting Node" (Nokia, Nokia Shanghai Bell, Orange, Qualcomm Incorporated, CATT) CR 38.413 Rel-17

[5] R3-232701 "Correction of Multicast Supporting Node" (Nokia, Nokia Shanghai Bell, Orange, Qualcomm Incorporated, CATT) draftCR 38.300 Rel-17

[6] R3-232862 "Delay issue on initialization of initialRX-DELIV" (Huawei, CBN, China Unicom, Samsung, Lenovo, CMCC) discussion

[7] R3-232863 "Correction on the delay issue on initialization of initialRX-DELIV" (Huawei, CBN, China Unicom, Samsung, Lenovo, CMCC) CR 38.413 Rel-17

[8] R3-232864 "[DRAFT] LS on the delay issue on initialization of initialRX-DELIV" (Huawei) LS out

[9] R3-232884 "Thoughts and Approaches for proper initialization of multicast MRB PDCP COUNT including [draft CRs for several TSs]" (Ericsson) other