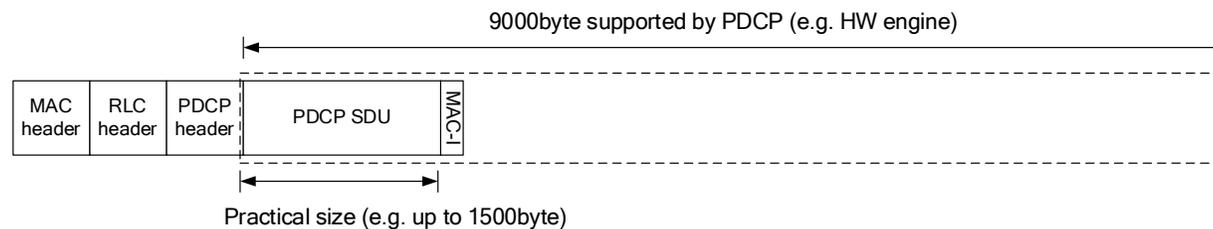


High-Speed Packetization in Rel-19

Background and Motivation

(Very) high data rate requires the processing burden in UE side.

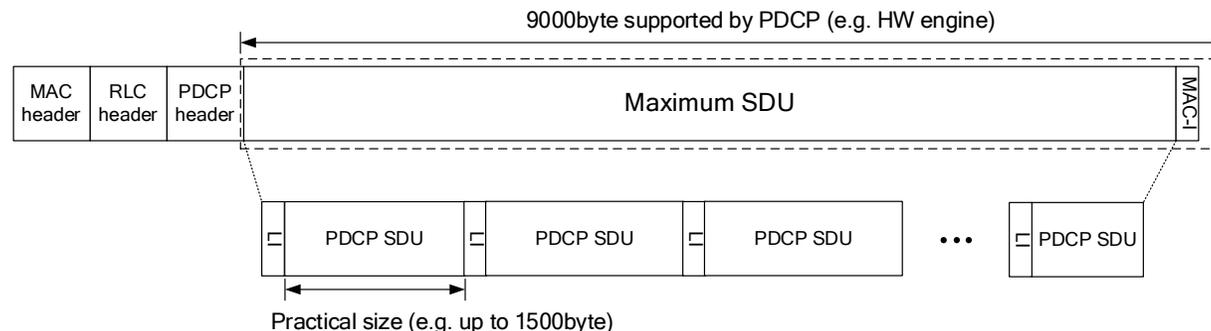
- UE needs to handle tremendous number of L2 headers at high data rate.
 - 1.6 million of L2 headers should be processed per second at 20 Gbps.
- The User Plane Integrity Protection (UPIP) at any data rate becomes mandatory, which results in significant performance degradation on data processing.
- The data processing capacity of hardware accelerator is not fully utilized, i.e. to process only 1500 byte with the capacity of 9000 byte (as required by PDCP).



Justification

Concatenation at PDCP enables maximum SDU[†] processing.

- High data rate would be required to e.g. emerging XR services.
- Several benefits are foreseen by combining multiple PDCP SDUs into one.
 - The number of L2 headers to be processed would be significantly reduced as the number of concatenated SDUs increases.
 - The concatenated SDUs can be processed with one-time initialization and key expansion, which reduces the UPIP processing time.
 - The data processing capacity of hardware accelerator of 9000 Byte can be fully utilized.
 - The specification impact would be relatively small compared to re-designing UP protocol stacks.



Potential Objectives of the WI

The detailed objective of the work item would be:

- Study and specify concatenation in PDCP layer to reduce the number of L2 headers (i.e. MAC, RLC, and PDCP), and to simplify the processing for UPIP. [RAN2, RAN3]
 - Structure of PDCP PDU constructed by concatenation.
 - Allocation of COUNT value.
 - Transmit operation and the receive operation with PDCP concatenation.
 - Support of Mobility, Carrier Aggregation, and Dual Connectivity.