clarifications on LDPC

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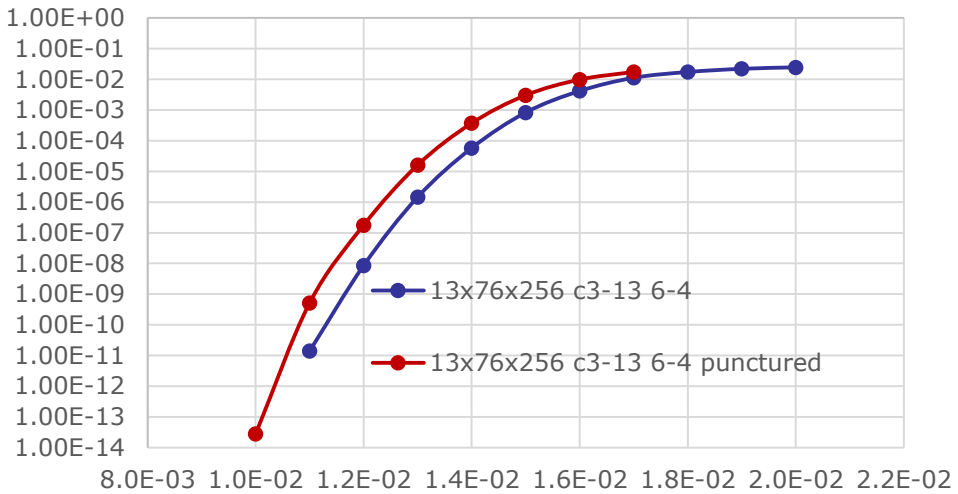
Background

- A few more issues of LDPC are mentioned in bonk_3ca_1_1117 and wey_3ca_1_1117
  - Size reduced LDPC cannot maintain performance together with throughput
  - LDPC latency is too much to support 5G wireless fronthaul transport

- We would answer the issues with current research

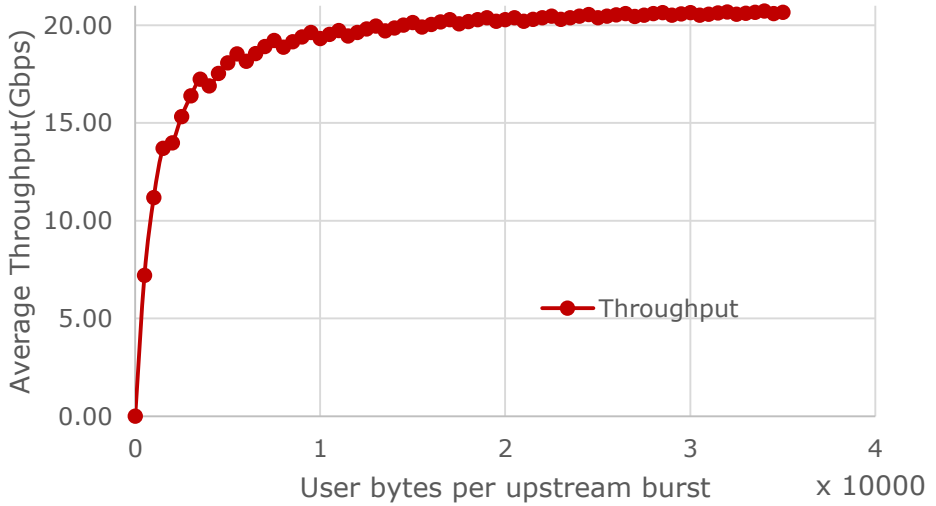
Size reduced LDPC

- LDPC with shortening and puncturing still meet the performance objective
  - Code rate is still 0.848 with 451bits shortened and 512bits punctured



LDPC(18493,15677) from jinyinrong_3ca_2b_0717

- 20Gb/s achieved at least 17300 bytes burst size
  - Line rate 25.78125Gb/s
  - Laser On time 32ns
  - Laser Off time 32ns
  - Gap time 32ns
  - Sync Time 200ns(5000bits@25Gb/s)
  - Line code 64b/66b
  - Last CW with 512bits punctured and x bits(relay on actual length) shortened
  - Reduce burst overhead can relax requirement of burst size



Latency

- LDPC latency is not that large
  - LDPC(18493,15677) of jinyinrong_3ca_2b_0717 decode with no more than 15 iterations. So the delay < 6us
  - Parallelism can further reduce the latency

	RS(255,223)	LDPC(18944,16128)
Baseline	2 μs	
15 iterations		6 μs
30 iterations		13 μs
50 iterations		21 μs

wey_3ca_1_1117

- LDPC latency is not the bottleneck for 5G fronthaul
  - Fiber propagation and DBA contribute main latency
  - Latency of ~100us of IEEE1914 is only enough for 20km transmission without considering about wireless process
  - Short instance and improved DBA(Fixed size grants in high frequency without reports) can release plenty of time margin

Summary

- LDPC with shortening and puncturing still meet the performance and throughput objectives with certain length of burst
- LDPC latency is not the main issue of 5G fronthaul

Thank You