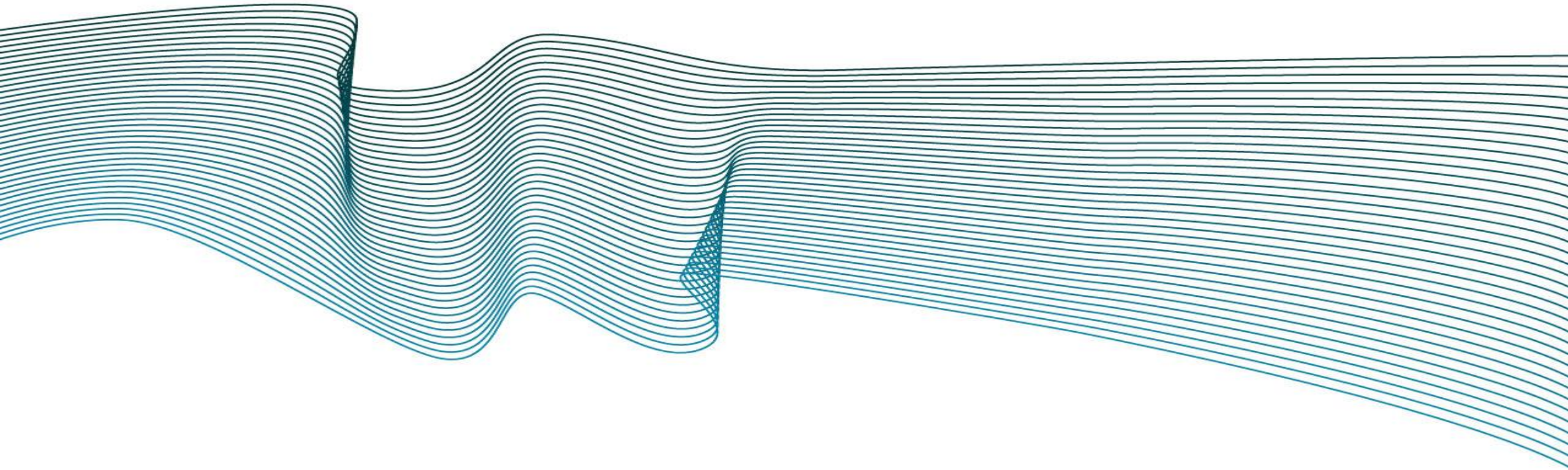
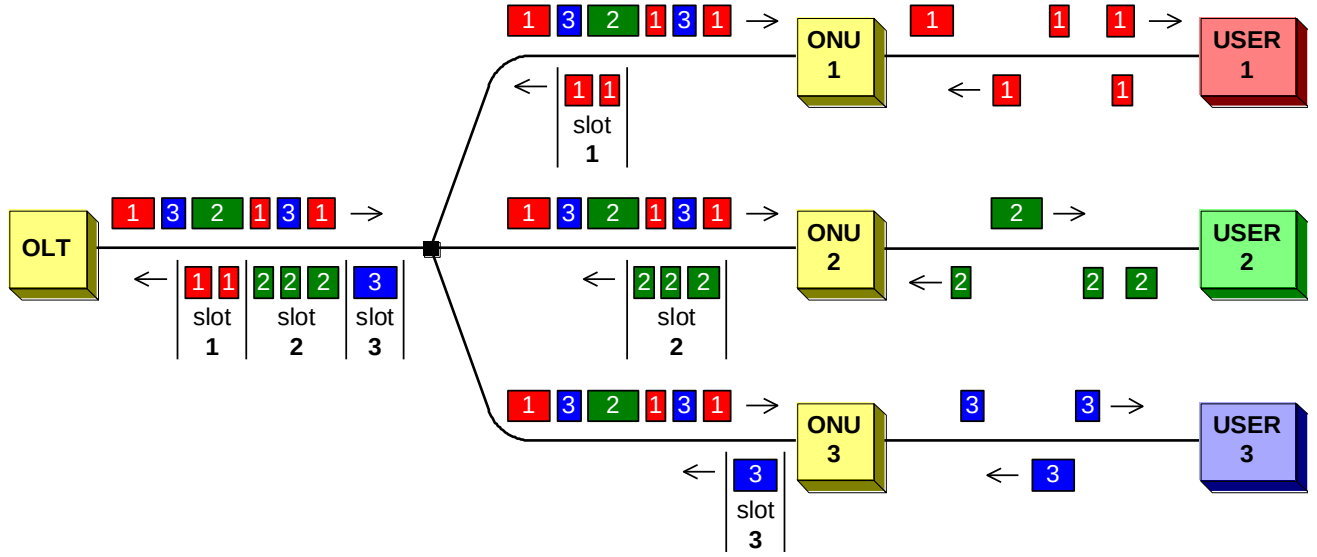


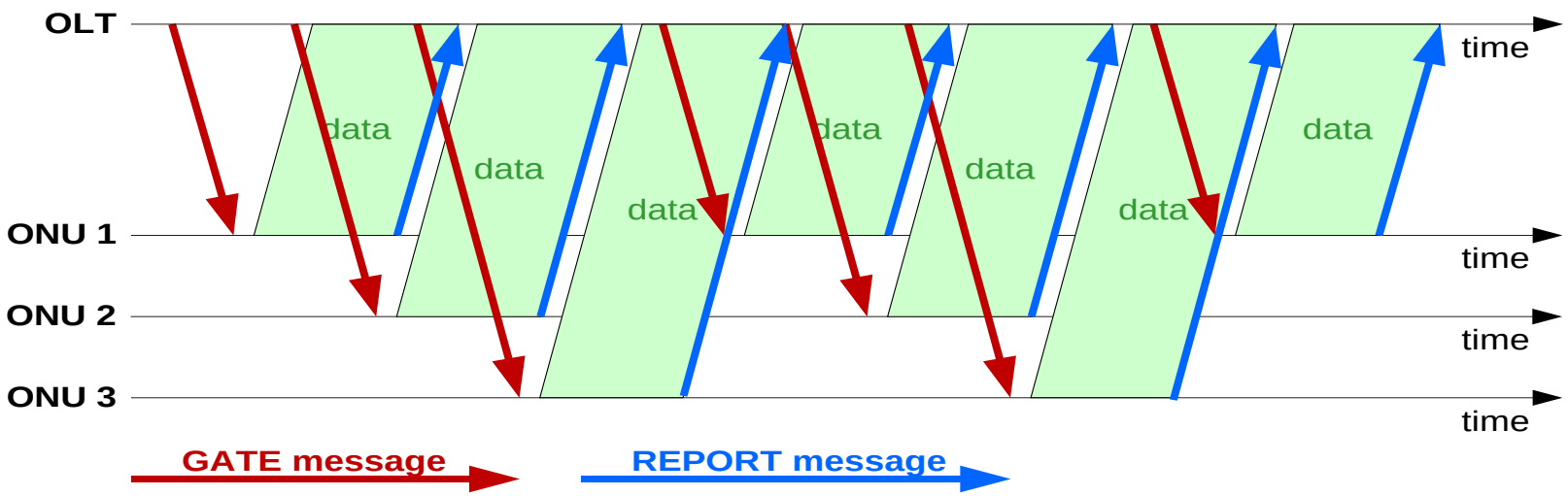
DMLT Objectives and EPON

Glen Kramer

TDM Transmission in EPON

- **All MACs in EPON are full-duplex MACs**
- **Downstream transmission**
  - Single transmitter at the OLT transmits data or idles continuously.
- **Upstream transmission**
  - To avoid collisions, ONUs transmit in non-overlapping timeslots
  - Bandwidth assignment is done using GATE messages
  - MAC Control in the ONU enforces stop-and-go behavior
  - PHY turns laser off when it sees it sees long stream of idles





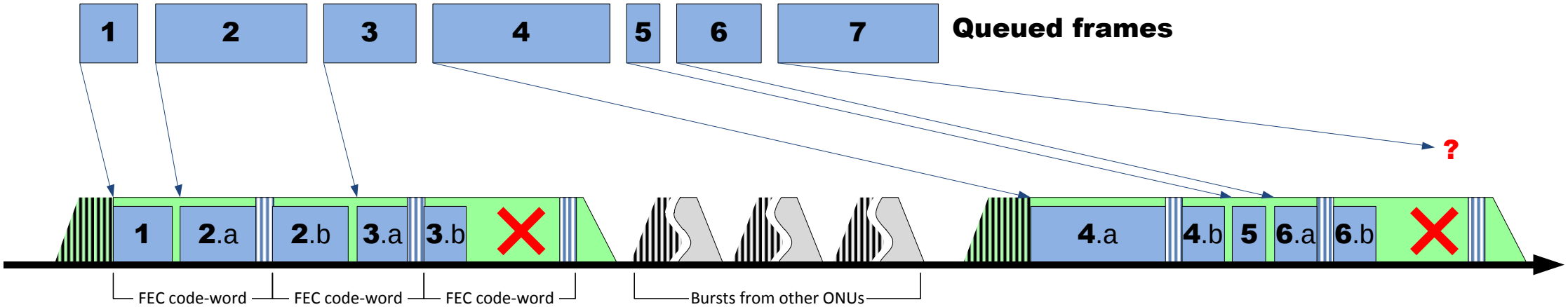
Stream-based FEC

- **10G-EPON introduced stream-based FEC RS(255, 223).**
- **After alignment with 66b/64b blocks, we have**
  - Code-word: 248 octets
  - Payload: 216 octets
  - Parity: 32 octets

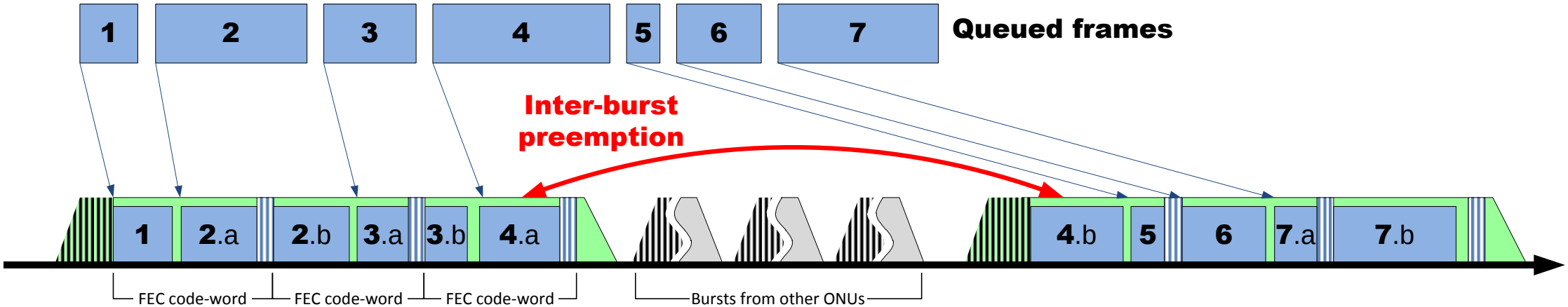
- **OLT grants ONU an integer number of FEC code-words.**
- **Cumulative length of frames queued at the ONU almost never align with available grant space (N code-words x 216 octets of payload)**
- **Unused grant remainder is between 1 and 215 octets.**
- **Higher speeds will likely require even larger FEC code-word sizes, so the problem will exacerbate**

Unused upstream slot remainders

Without inter-burst frame preemption



With inter-burst frame preemption



Proposal

- **The mechanism proposed for packet preemption in DMLT can solve the unused slot remainder problem**
- **EPON may also be used in time-critical environments and would benefit from DMLT mechanisms applied in either one or both directions.**
- **There is no technical reasons why EPON should be excluded from the DMLT scope**

- **Proposal:** **Modify the DMLT objective as follows:**

5. Support full duplex ~~point-to-point~~ operation only.

Thank you