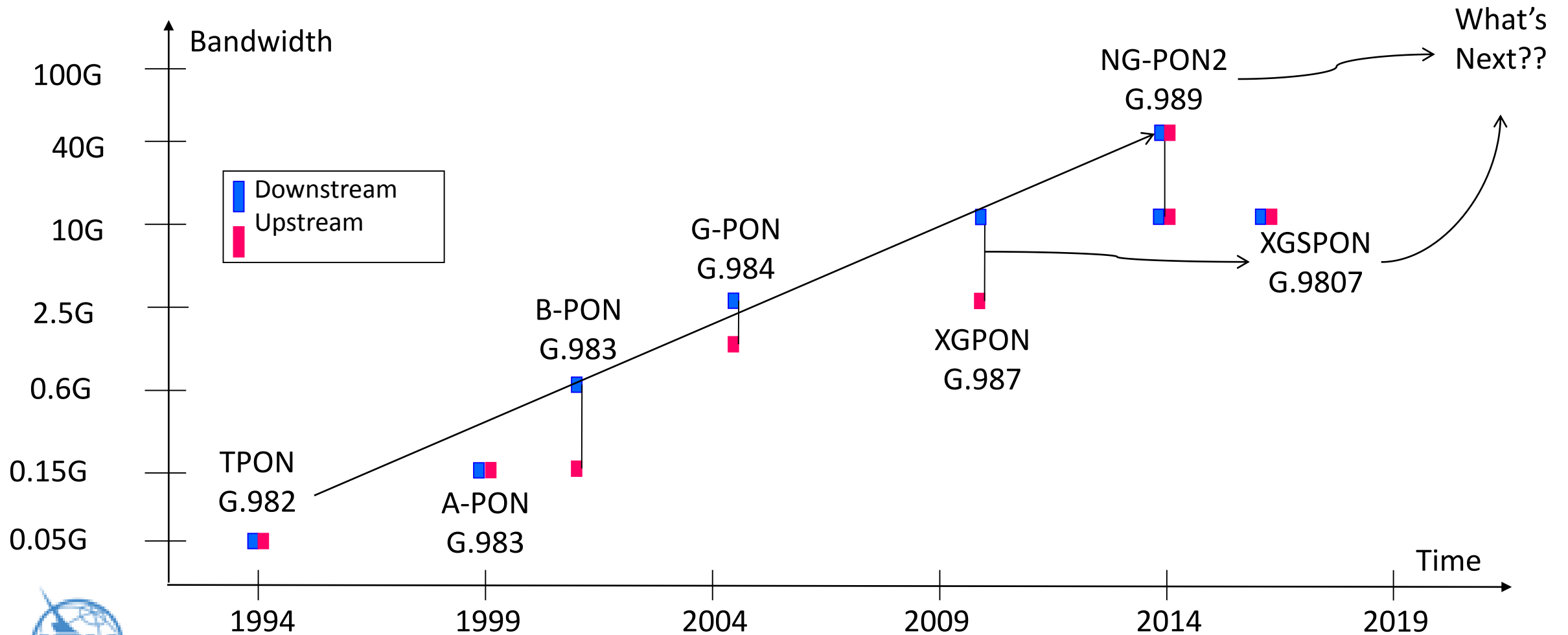


ITU-T Q2 work program

*Frank Effenberger
Rapporteur, Q2/15*

PON technology and standards



Current and recent projects

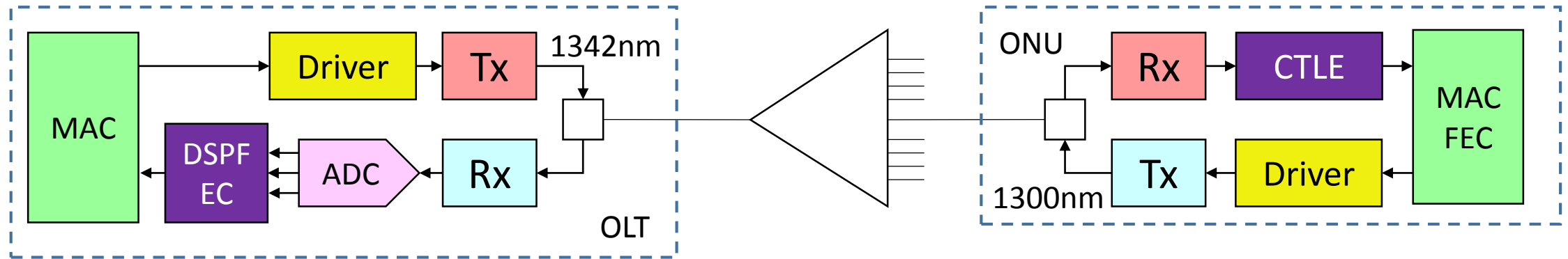
- G.984.5 Am: CE parameters, Multi-PON module
- G.988: Regular maintenance of PON management
- G.989 Amendments: Channel bonding, cooperative DBA
- G.sup.TCadapt: Clarifying how G.9807 TC is a subset of G.989 TC
- G.sup.HSP: Exploring higher speed PONs
- G.sup.5GP: Exploring 5G applications of PON

Higher Speed PON

- G.hsp.Req: The requirements for higher speed PONs
 - Meant to be a collector of all PON requirements, working to find application sets that define reasonable systems
- G.hsp.ConvTC: The specifications for a converged TC layer
 - Meant to cover all HSP systems (single and multiple wavelengths, fixed and tunable optics), and maximum commonality with other systems
- G.hsp.50Gpmd: Specifications of fixed 50G PMD
 - A successor to XG(S)-PON
- G.hsp.TWDMpmd: Specifications of the higher rate TWDM PMD (ie., tunable ONU optics)
 - A successor to NG-PON2

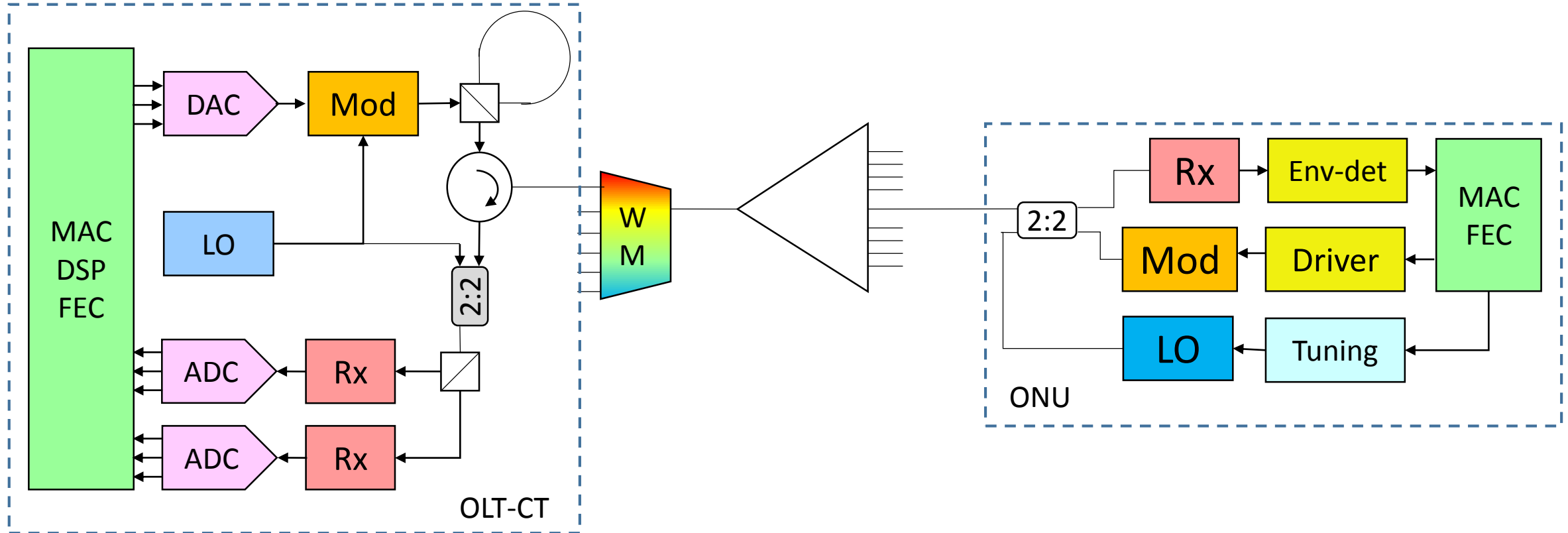


Hypothetical 50 Gb/s TDMA PON system



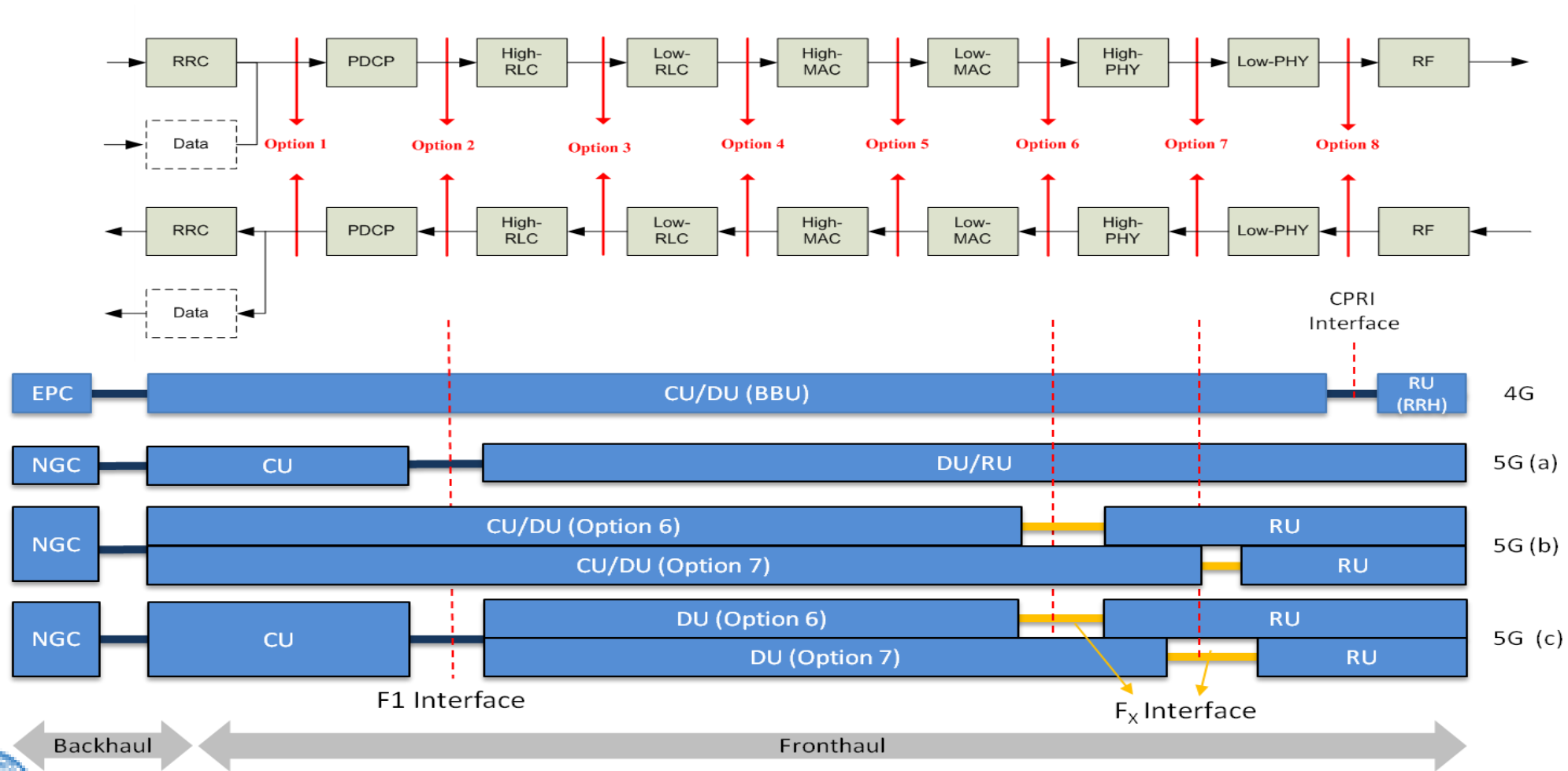
- Single channel system for low cost overall
- Use continuous time linear equalizer in downstream for low ONU cost
- Use DSP in the upstream to implement equalization and burst mode reception
- Wavelength plan reuse of 802.3ca
- MAC implements low density parity check (LDPC) code with soft decoding for high sensitivity, and flexible rate decoding for link budget elasticity

Hypothetical 50 Gb/s coherent TWDM-PON system

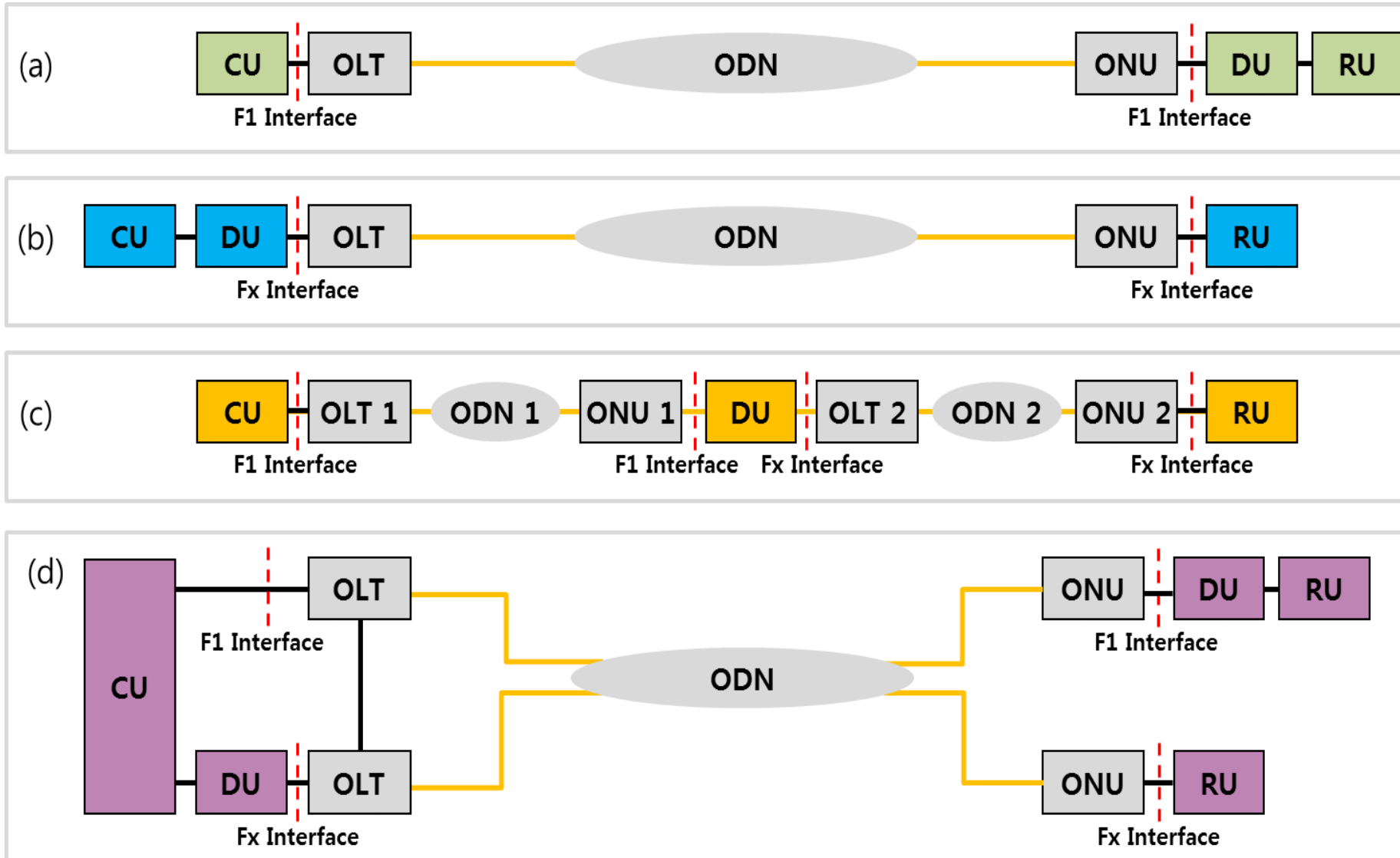


- Coherent transmission allows 50G transmission in the C and L bands over long distances
- Low-cost coherent (e.g., Alamouti coding) could reduce need for DSP at the ONU
- Full coherent receiver in upstream enables good loss budget

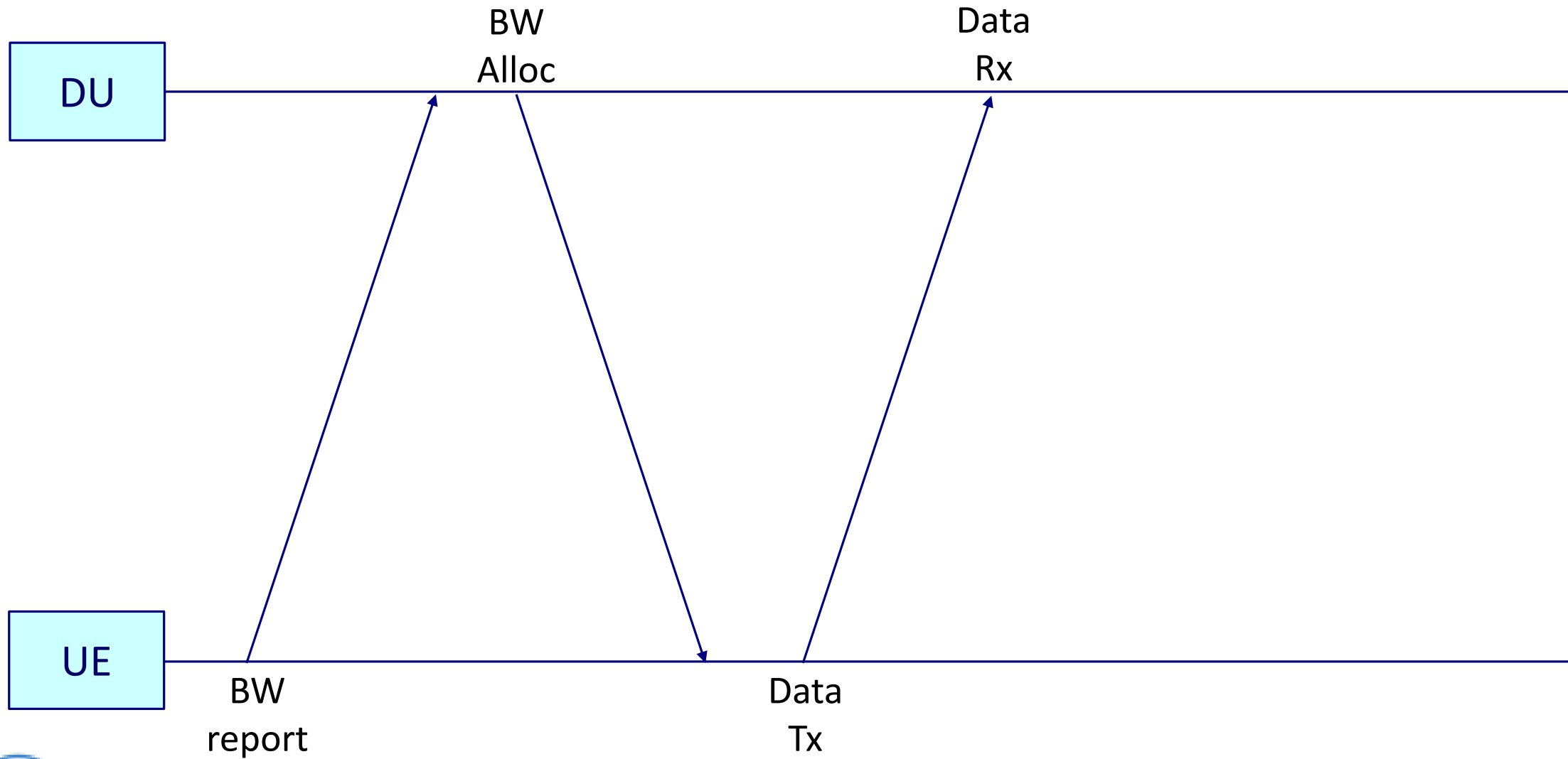
G.sup.66: 5G wireless fronthaul requirements in a PON context



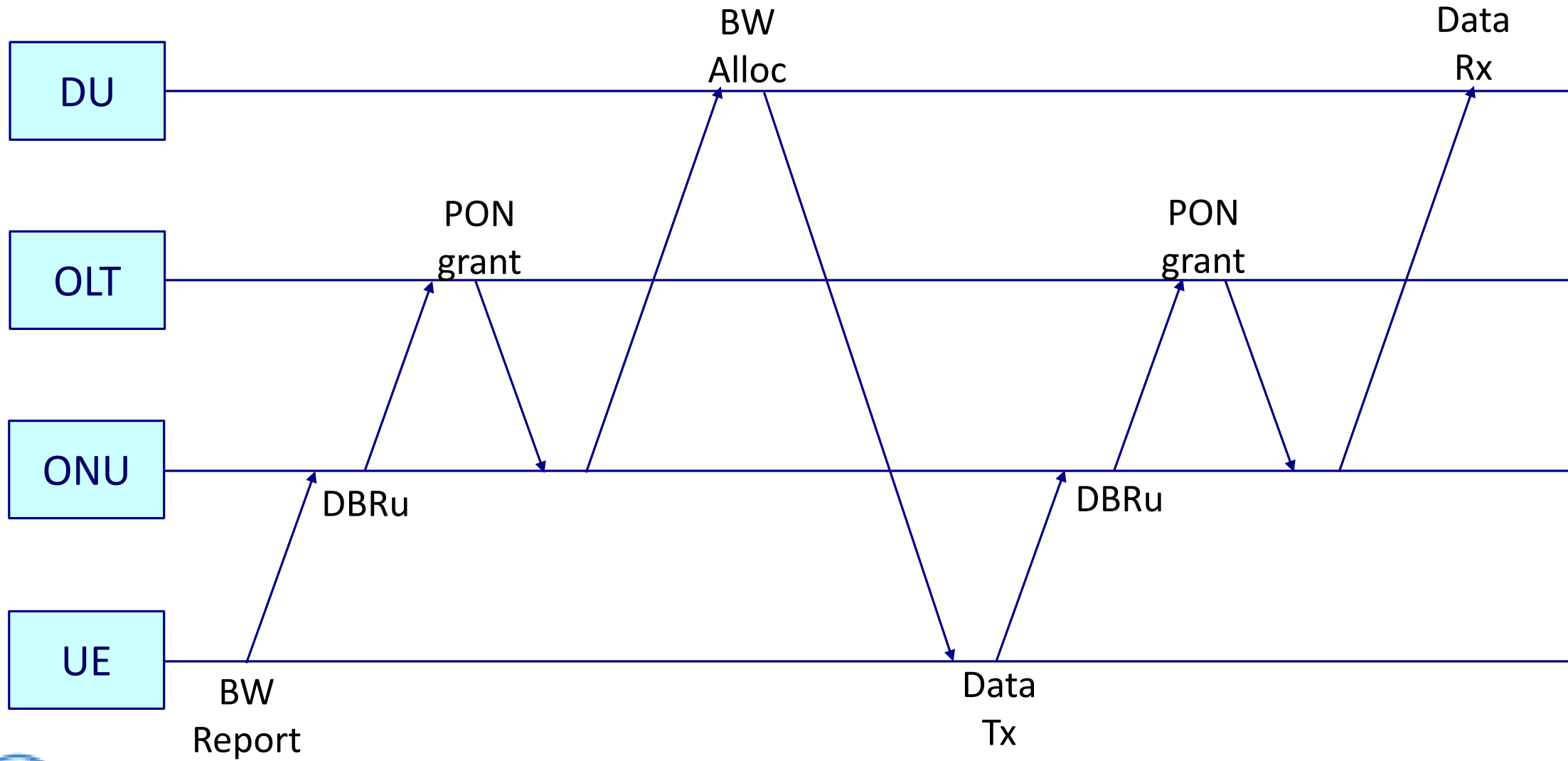
How might PON serve fronthaul needs?



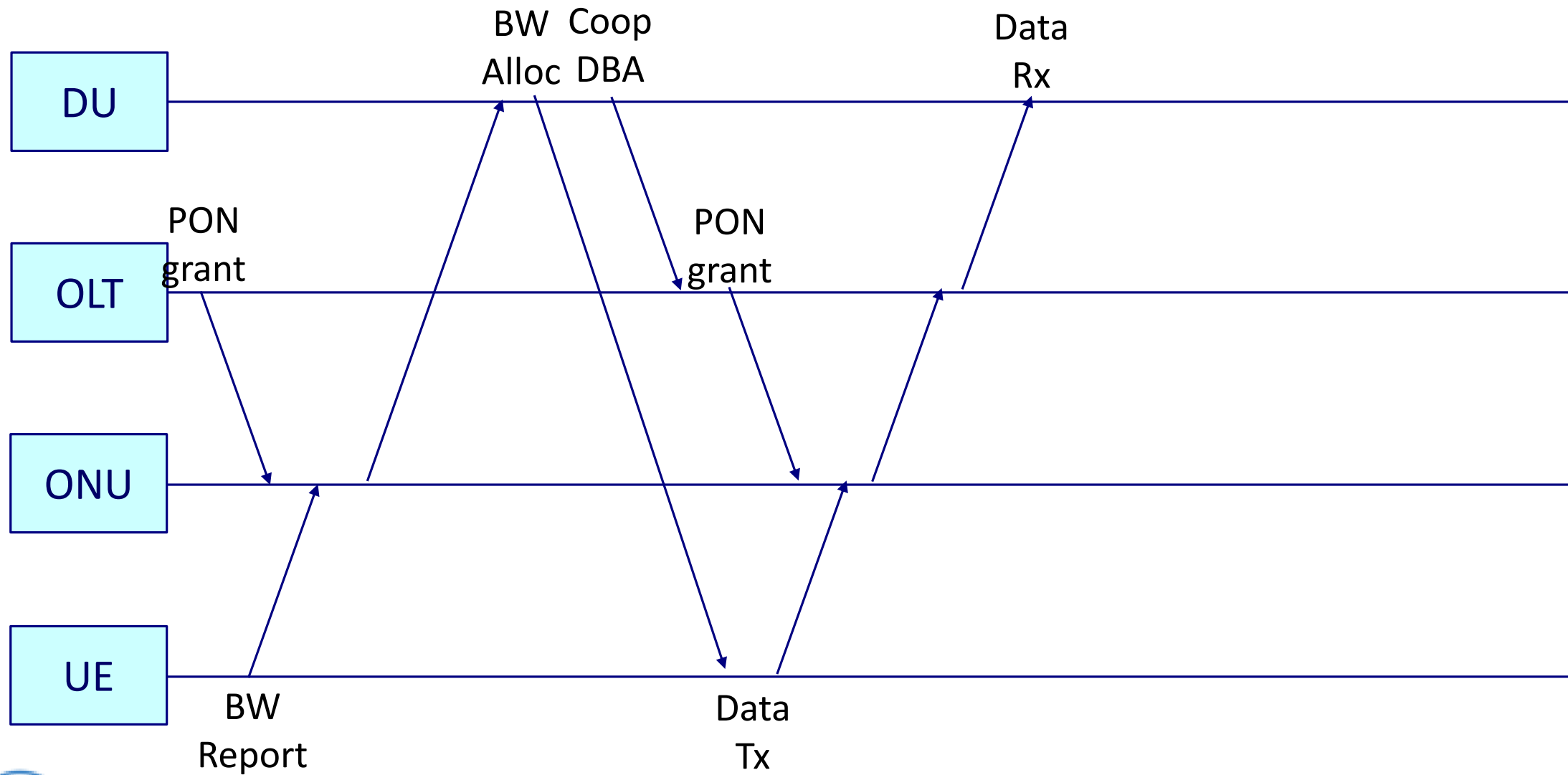
Wireless latency requirement is strict



The problem of fronthaul over PON



Cooperative DBA: How to run a MAC within a MAC



Point to point systems

- G.9806: Higher speed point to point optical access systems
 - Meant to be a follow on to G.986 (1G P2P Optical Access)
 - Aims to describe 10G, 25G, and 50G systems
 - A range of loss budgets are under consideration
 - “Silent start” feature, to avoid P2P ONUs jamming PONs
- In IEEE 802.3 there is a twin project, with exactly the same scope
 - The intention is to ensure convergence and compliance to one standard

Summary

- Q2/15 is the standing group that works on optical access networks, with a wide range of projects spanning several PON generations
- Substantial work plan on higher speed (>10G) access
- Aim is to make this the “Last PON”
 - Common requirements and TC layer that is scalable to any reasonable rate combination
 - Many PMD projects to allow development at the pace of the technology (The PMD is generally the gating item on systems)



Thank you