

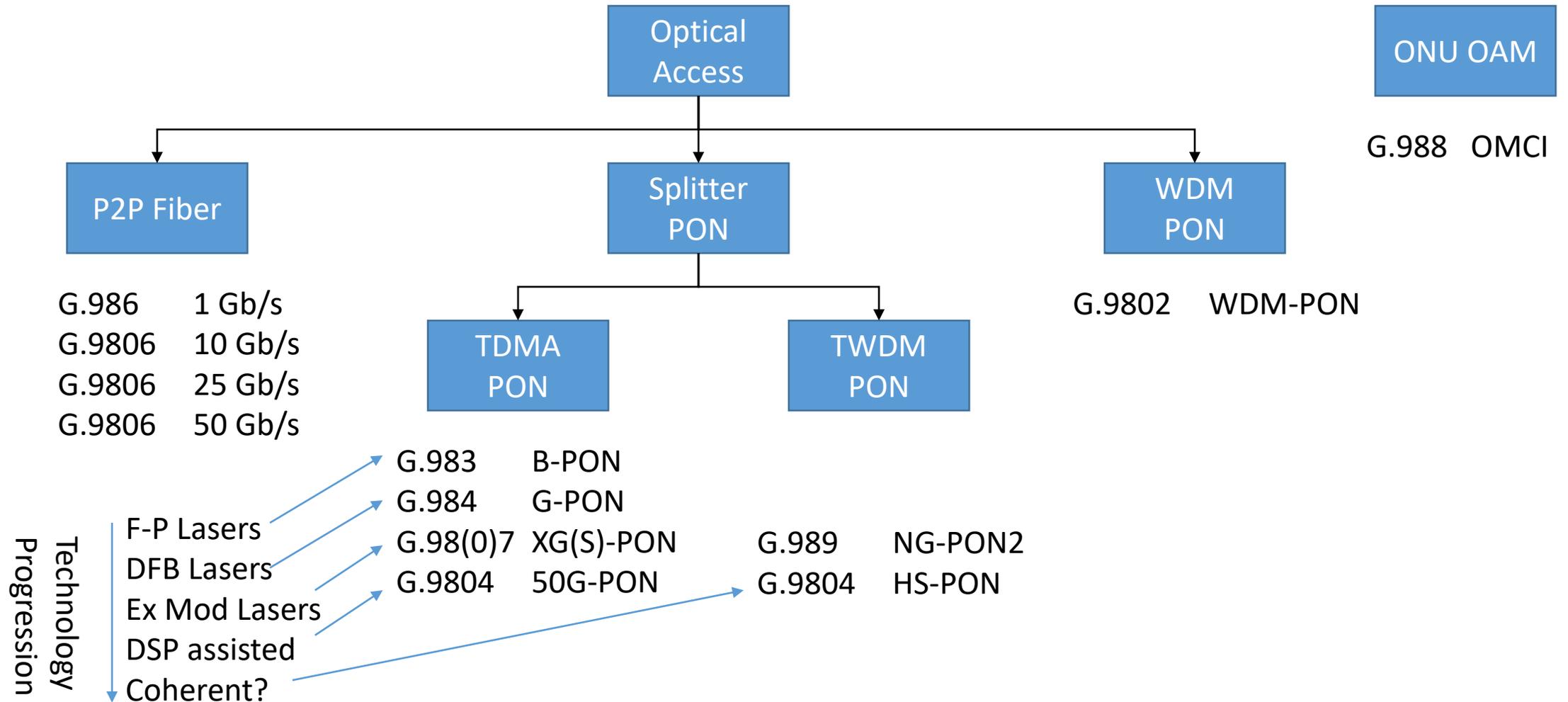
Q2 Optical Access Networks and FTTRoom systems

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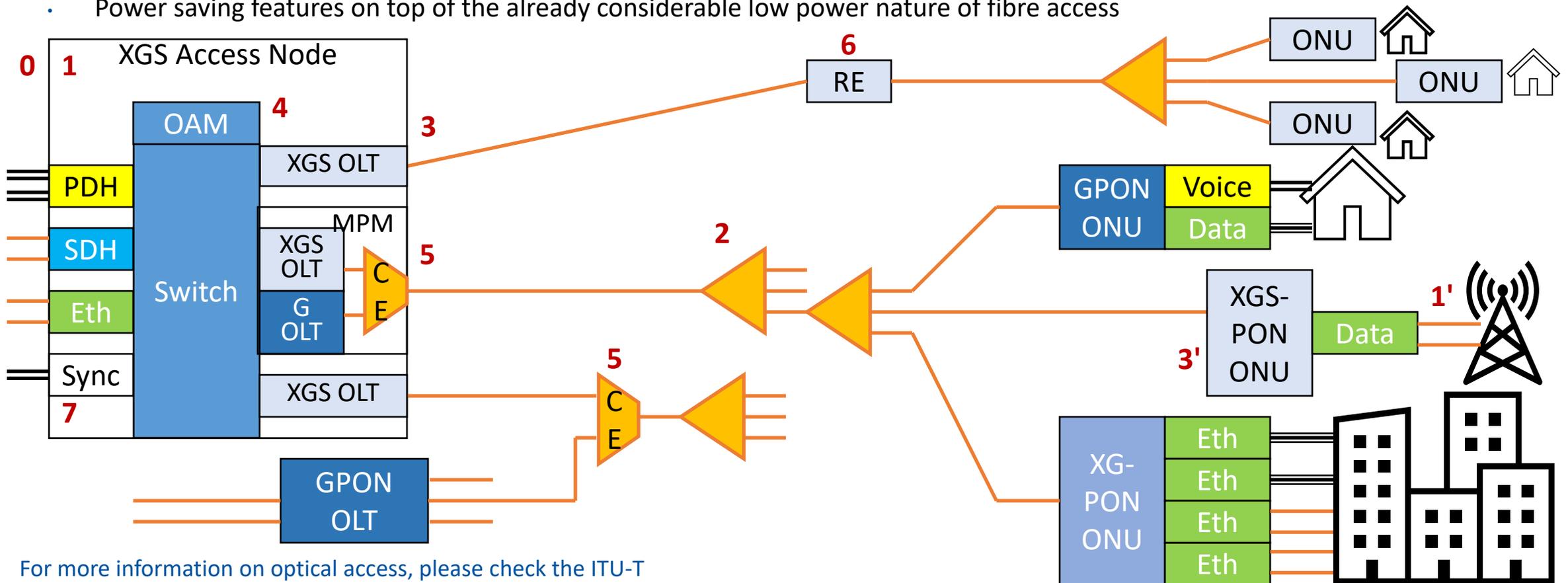
Overview of optical access: A need for speed



An example system

G.9807: Ten Gigabit Symmetric Passive Optical Networks

- G-PON compatibility via a wavelength plan, blocking filters, loss budget for coexistence on a common ODN, and a combo OLT
- Support for single-sided and mid-span reach extension, with reach up to 60 km
- Full-service support with symmetric rate – including voice, TDM, Ethernet (up to Gigabit rates), xDSL, wireless xhaul
- Powerful OAM&P capabilities providing a feature rich service management system
- Advanced security features including authentication, rogue detection, and information privacy
- Power saving features on top of the already considerable low power nature of fibre access

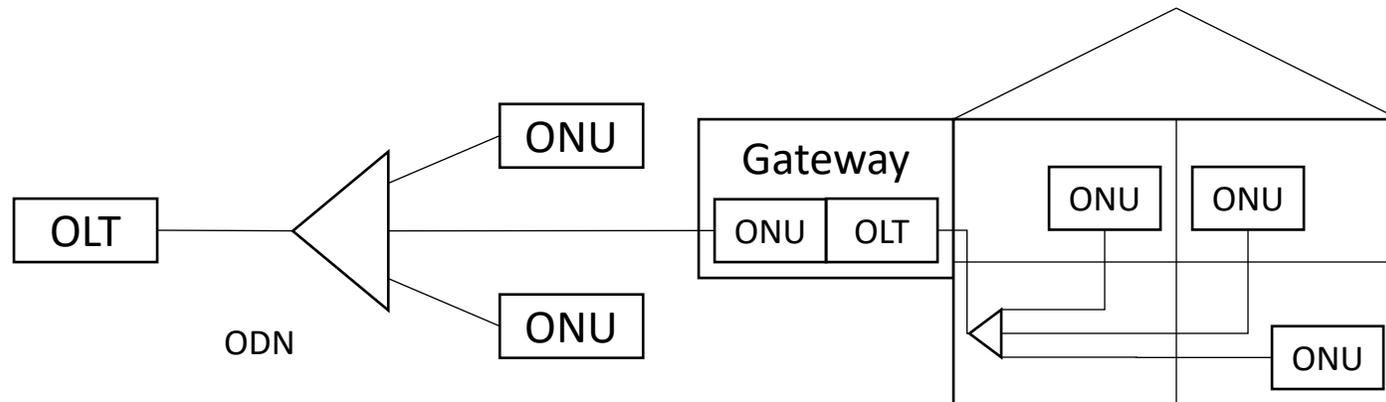


What Q2 brings to the table

- Significant experience on several relevant technologies
 - Low-cost optics for access: Balancing cost and performance
 - Specialized MAC adapted to PON: IM-DD greatly limits what we can do
 - Embedded management systems: We do in one Q what WP3 does in 5
 - Support of a wide range of services: We deal with the whole stack
- It is not clear that we should reuse any of the technology already developed, but it is interesting to think about how we might
- The following outlines one such concept, just to spur your imagination

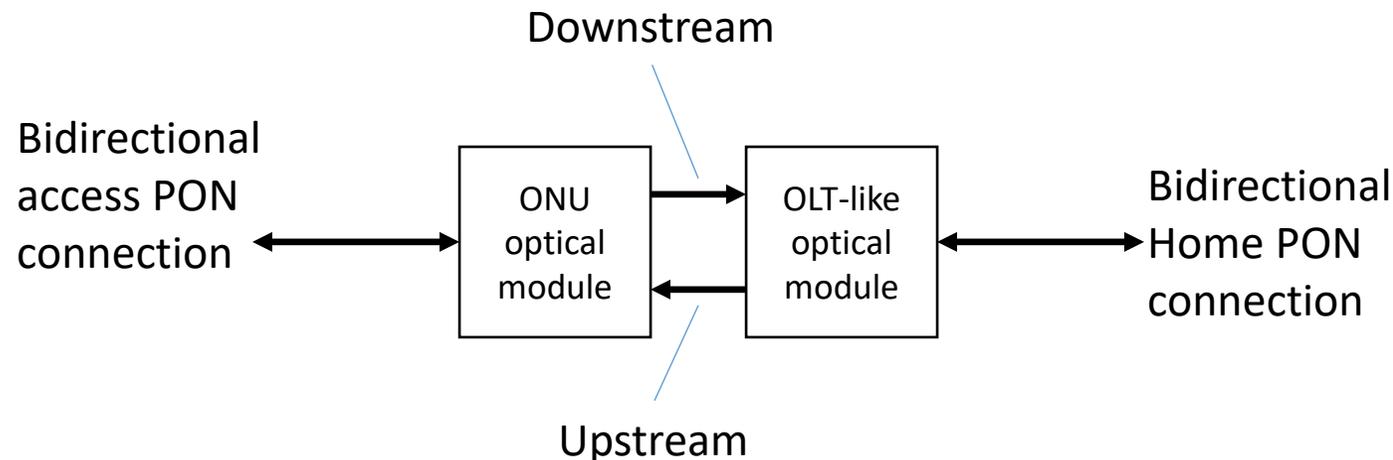
Simplest concept of FTTR

- There are two TDM-PONs in tandem: Access PON and Home PON
 - It can't be one PON, because of loss budget considerations
- The gateway at the side of the home is an ONU on the access PON and the OLT for the home PON
- Issues: The OLT functions are quite complex. Placing that at every home is likely to add significant cost, and configuration complexity



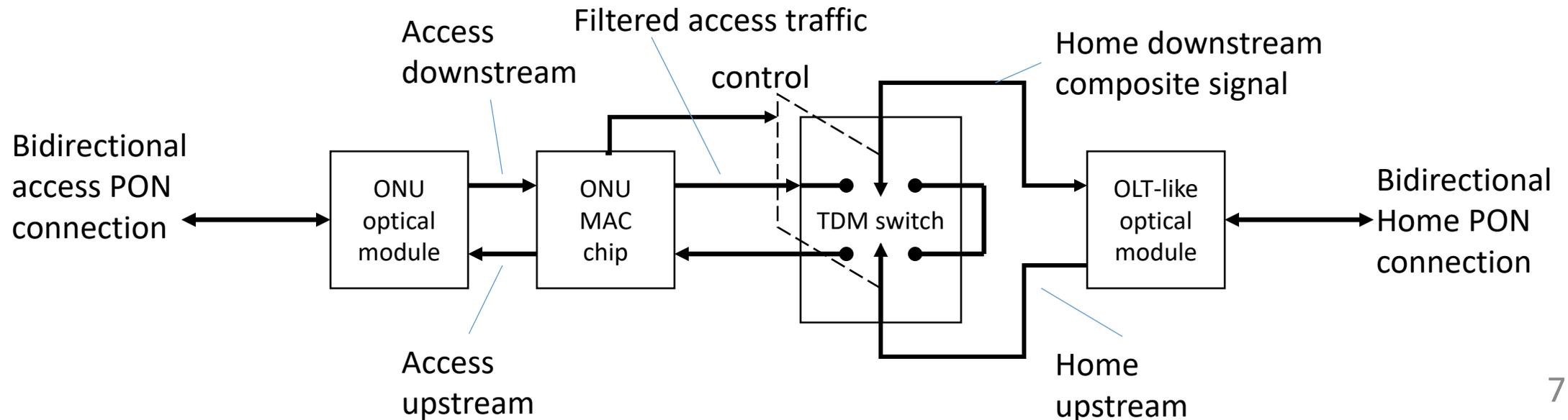
The "reach extender" home gateway

- The gateway could be built so that it only provides regeneration
 - As pictures, this is done by connecting two PON PMD's back-to-back
 - There are some complexities in how we manage burst mode...
- The issue here is that logically the whole system is one PON. All the intra-home traffic will have to go up to the OLT and then back down
 - This will greatly impact the bandwidth efficiency, and presents security issues



The intelligent home gateway

- The gateway is an ONU that filters the traffic for that user, and provides control
- There is also a "TDM switch" that either connects the two PONs together, or loops the home PON back on itself
 - Local traffic is contained! The system capacity is increased by the number of homes
 - This switch is controlled by the OLT, the gateway does very little packet processing
- There is only one (access) OLT: It controls the room ONUs as well as the gateways



Summary

- FTTRoom seems to be a very interesting concept
- PON may take a role
- Q2 is ready to help