Potential technology reuse for ITU-T Q2/15 systems

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Outline

- The inventory of ITU-T Q2/15 optical systems
- What could be reused
- What is not suitable
- Architectural differences

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The inventory of ITU-T Q2/15 optical systems

- TDMA PON: G.984, G.98(0)7, G.9804 — Very attractive
  - 2.5, 10, 50G P2MP systems
- WDM PON: G.9802 — Too much
  - 25G per ONU P2MP system
- TWDM PON: G.989 — Too complicated
  - 4x10G P2MP system
- Bidi P2P: G.98(0)6 — Also interesting
  - 1, 10, 25, 50, and 100G links

What could be reused

- TC layers adapted to control a fiber infrastructure are quite scalable and able to be extended to many more endpoints
- Device management systems, including proxy style, are commonly used and have enabled interoperability

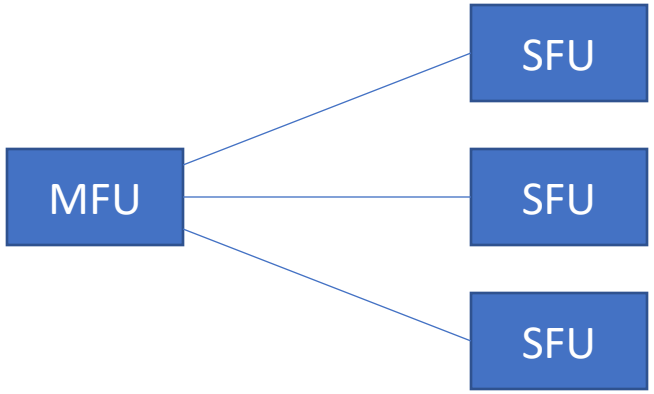
What is not suitable

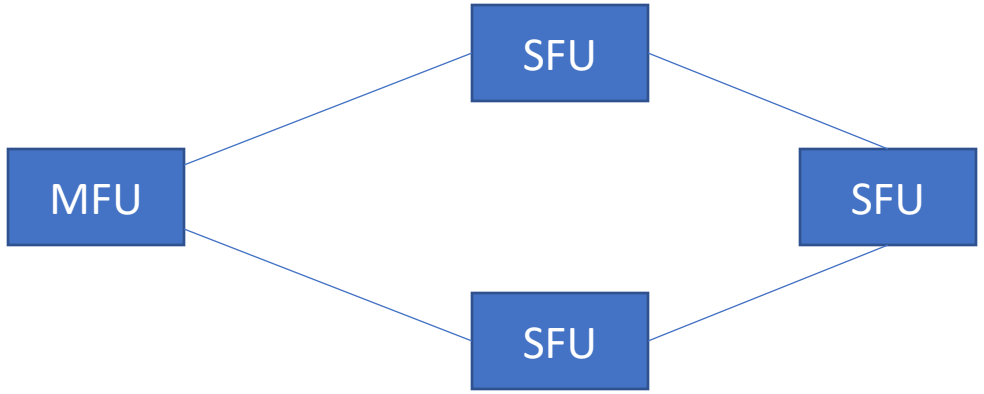
- Optical access systems have been built to work on the tree-and-branch architecture of the optical distribution network
  - In almost all cases, this gives a P2MP topology with one root and many leaves, where only the root and leaves can talk to each other
- The power budget and distances are significantly different
  - ODN is 20 km reach, and ~30 dB of loss
- The systems need to coexist, because the public ODN is a long-lasting infrastructure that must support multiple systems and operators

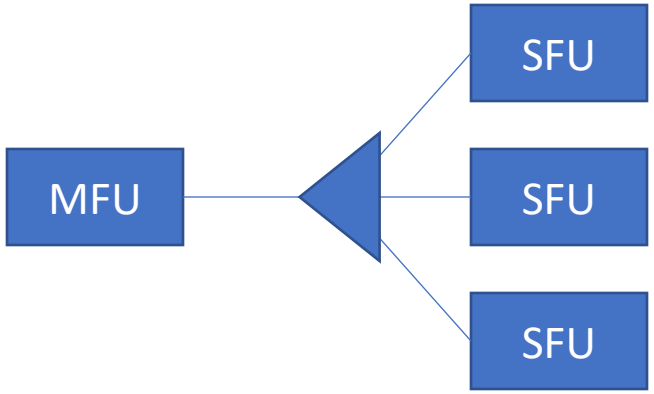
Architectural differences

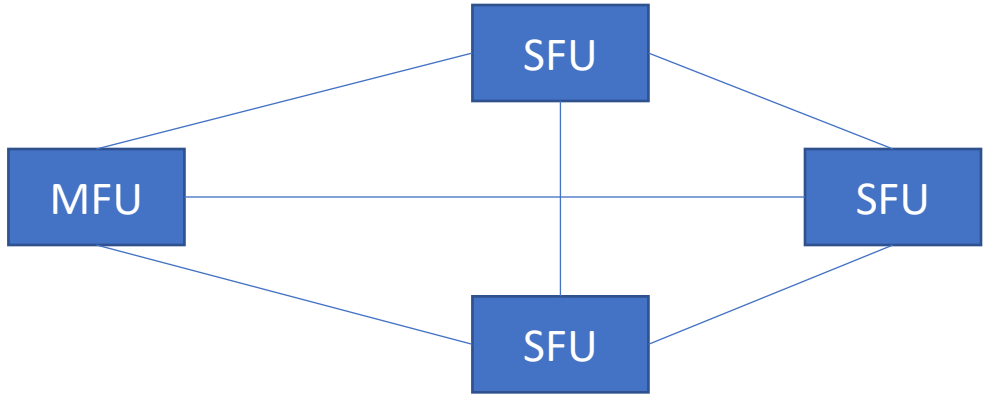
- If we emphasize differences of FTTR from FTTH, we might say
  - Distances very short (100 m instead of 20 km)
  - Loss budget lower (several dB instead of 30 dB)
  - Data flow is more MP2MP
  - Network is single customer, meaning ONUs need not be independent
  - Cables will be manufactured, so we could go two-fiber in principle
- This suggests that tree and branch may not be the only choice for how we deploy fiber in the building
  - Daisy-chain type networks of some sort are possible
  - Even mesh or ring could be a factor

Examples of topologies









Conclusions

- ITU-T Q2/15 have a wide range of techniques that could be leveraged
- The upper layers look to be more directly useable
- The physical layers perhaps are not a tailored to purpose
  - Yet they are still attractive because they have been cost-reduced so much
- More work is needed to investigate all these possibilities

Thank you! Any questions?

Any questions on PON?
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