Backward Compatibility and Co-existence for 10Gb/s EPON

Toshiaki Mukojima
(mukoujima380@oki.com)

Oki Electric Industry Co., Ltd.
Bandwidth Efficiency for Backward compatibility

- **Bandwidth efficiency**
  - Should be considered as same bandwidth efficiency as the current 1Gb/s EPON system to meet for future various broadband services.
  - Should be considered the Impact for MAC (MPCP) layer to get the required 10Gb/s EPON bandwidth efficiency.

- **Impact to MPCP standard**
  - If 10Gb/s EPON needs same bandwidth efficiency as Gigabit EPON, MPCP layer may change.
  - Gigabit EPON uses a 16-ns time quantum as an upstream unit. But, the 64B/66B coding is used in 10 Giga Ethernet, the upstream burst signal should include a multiple of 66 bits.
  - 165 bits of 64B/66B coding signal are accommodated in 16 ns. These bits are not decoded in receiver. So, 2 Time quanta have 330 bits. This is 5 times 66 bits.
  - The grant should be a multiple of 2 time quanta. Current 802.3ah does not consider such case.

Co-existence applications

- **Should be Considered PMD of 10Gb/s symmetric EPON for co-existence the following applications**
  - Existing PON (GE-PON, BPON) infrastructure should be used.
  - 10Gb/s EPON and 1Gb/s EPON should coexist in a same fiber.
  - Optical overlay of RF video should be supported.

![System model](image)

**Fig.1 System model**
Conclusion

We propose adding the following items to Objectives.

- Bandwidth efficiency and impact for MAC(MPCP) layer.

- Should consider PMD for 10Gb/s symmetric EPON for co-existence the following applications.
  - Existing PON (GE-PON, BPON) infrastructure should be used
  - 10Gb/s EPON and 1Gb/s EPON should coexist in a same fiber.
  - Optical overlay of RF video should be supported.