

**P802.3ca
Objectives
[Proposed Revision]**

January 2018

Current Objectives

NG-EPON

- ❑ Support subscriber access networks using point to multipoint topologies on optical fiber
- ❑ Provide specifications for physical layers operating over a single SMF strand and supporting symmetric and/or asymmetric MAC data rates of:
 - 25 Gb/s in downstream and less than or equal to 25 Gb/s in upstream
 - 50 Gb/s in downstream and less than or equal to 50 Gb/s in upstream
 - 100 Gb/s in downstream and less than or equal to 100 Gb/s in upstream
- ❑ PHY(s) to have a BER better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent)
- ❑ Support coexistence with 10G-EPON
 - Optical power budgets to accommodate channel insertion losses equivalent to those supported by the 10G-EPON standard
 - Wavelength allocation allowing concurrent operation with 10G-EPON PHYs

Proposed Modifications (in red)

- ❑ Support subscriber access networks using point-to-multipoint topologies on optical fiber
- ❑ Provide Physical Layer specifications that
 - Operate over a single SMF strand
 - Support symmetric and/or asymmetric MAC data rates of:
 - 25 Gb/s in downstream and less than or equal to 25 Gb/s in upstream (25G-EPON)
 - 50 Gb/s in downstream and less than or equal to 50 Gb/s in upstream (50G-EPON)
 - ~~100 Gb/s in downstream and less than or equal to 100 Gb/s in upstream (100G-EPON)~~
 - Have a BER better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent)
 - Support coexistence with **select legacy PON technologies**
 - Optical power budgets to accommodate channel insertion losses equivalent to **PR20 and PR30, as defined in Clause 75.**
 - Wavelength allocation allowing concurrent operation with 10G-EPON, **XG-PON1, and XGS-PON** PHYs
 - Wavelength allocation allowing concurrent operation of 25G-EPON and G-PON reduced wavelength set (**1480nm-1500nm downstream, 1290nm-1330nm upstream**) PHYs

On the 100G-EPON Objective

- ❑ Rush decision in Charlotte meeting in November to remove 100Gb/s objective

11/8/2017 3:50 PM

Motion #9

Remove “100 Gb/s in downstream and less than or equal to 100 Gb/s in upstream” from P802.3ca 100G-EPON Task Force objectives.

Moved: Dekun Liu

Second: Phil Miguez

For: 21

Against: 3

Abstain: 6

Technical ($\geq 75\%$) Motion Passed

- ❑ It took the TF four months of studies and discussions to put this objective in and it took about half-an-hour of discussion to take it out.

PMD Difficulties vs. PON Capabilities

- ❑ Four- λ PMD proved very difficult and objectives need to change.
 - We can remove 100Gb/s objective completely or...
 - We can remove the requirement to use single strand of fiber
- ❑ Clause 143 in D0.6 already describes 4-channel MPRS
- ❑ Most PON ODNs deployments have more than one fiber in trunk or drop cables.
- ❑ Dual-fiber optical modules exist
- ❑ Why not to allow operators to offer 100Gb/s service rate, if their ODN allows that?
- ❑ **Removing the 100Gb/s objective completely is a shortsighted decision. Don't throw the baby out with the bathwater.**



Do not preclude multi-fiber PONs

- ❑ Within each fiber strand we will have no more than two wavelengths in each direction
- ❑ One optical module may terminate two fibers or there may be two separate modules connected to a common ASIC. This is an implementation decision.
- ❑ Our existing skew remediation mechanism in Cl. 143 normalizes the propagation delay, regardless of whether its source is actual skew, internal logic delay variability, or propagation delay through different fibers.
 - Fiber delay delta should be within a reason of course. We may add a normative requirement for that.
- ❑ In other words, to support 100Gb/s PON, we simply extend the concept of channel bonding from bonding just the wavelengths to bonding wavelengths and/or ports (it all translates to separate channels anyway)

Proposed Modifications

Instead of this

- ❑ Provide specifications for physical layers operating over a single SMF strand and supporting symmetric and/or asymmetric MAC data rates of:
 - 25 Gb/s in downstream and less than or equal to 25 Gb/s in upstream
 - 50 Gb/s in downstream and less than or equal to 50 Gb/s in upstream
 - 100 Gb/s in downstream and less than or equal to 100 Gb/s in upstream

... say this

- ❑ Provide Physical Layer specifications that
 - Support downstream MAC data rates of:
 - 25 Gb/s using a single wavelength over a single SMF strand
 - 50 Gb/s using two wavelengths over a single SMF strand
 - 100 Gb/s using four wavelengths over two SMF strands (two wavelengths in each strand)
 - Support upstream MAC data rates of:
 - 10 Gb/ or 25 Gb/s using a single wavelength over a single SMF strand
 - 50 Gb/s using two wavelengths over a single SMF strand
 - 100 Gb/s using four wavelengths over two SMF strands (two wavelengths in each strand)

Final Proposed Version

10G-EPON

- ❑ Support subscriber access networks using point-to-multipoint topologies on optical fiber
- ❑ Provide Physical Layer specifications that
 - Support downstream MAC data rates of:
 - 25 Gb/s using a single wavelength over a single SMF strand
 - 50 Gb/s using two wavelengths over a single SMF strand
 - 100 Gb/s using four wavelengths over two SMF strands (two wavelengths in each strand).
 - Support upstream MAC data rates of:
 - 10Gb/ or 25 Gb/s using a single wavelength over a single SMF strand
 - 50 Gb/s using two wavelengths over a single SMF strand
 - 100 Gb/s using four wavelengths over two SMF strands (two wavelengths in each strand).
 - Have a BER better than or equal to 10^{-12} at the MAC/PLS service interface (or the frame loss ratio equivalent)
 - Support coexistence with select legacy PON technologies
 - Optical power budgets to accommodate channel insertion losses equivalent to PR20 and PR30, as defined in Clause 75.
 - Wavelength allocation allowing concurrent operation with 10G-EPON, XG-PON1, and XGS-PON PHYs
 - Wavelength allocation allowing concurrent operation of 25G-EPON and G-PON reduced wavelength set (1480nm-1500nm downstream, 1290nm-1330nm upstream) PHYs