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IEEE 802.3ca 100G-EPON Task Force:  
Notes/comments/questions from bi-weekly  
consensus call on Feb 18, 2016

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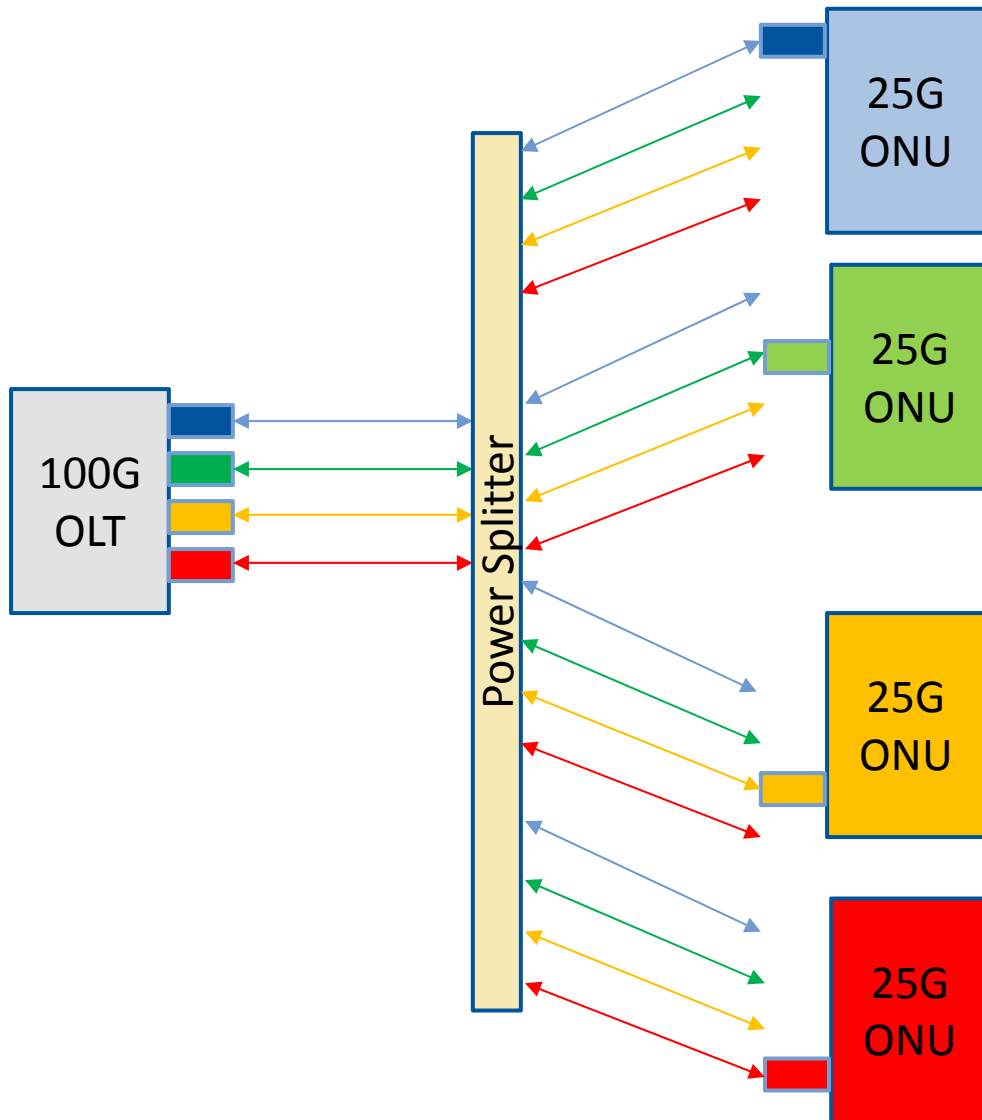
Shawn M. Esser  
February 18, 2016

A decorative footer graphic is located at the bottom of the slide. It consists of a dark blue horizontal bar on the left, which transitions into a larger, angled graphic on the right. This graphic features a dark blue background with glowing, interconnected lines and points, similar to the header, and is topped with a thin purple horizontal bar.

# ONU and Wavelength Philosophy

- ◆ First Gen 25G ONU/Wavelength Pair  $\lambda_0$  must be the lowest cost and to the market quickly. One of the highest priorities of the standard.
  - Utilizes 25G ASIC
  - Lowest cost means fixed laser wavelength and fixed filter for Rx (versus tunable laser and tunable filter for Rx)
    - Does standard need to specify fixed/tunable or leave it to the market to determine?
- ◆ 25G ONU (25G ASIC) on other Wavelength Pairs  $\lambda_1, \lambda_2, \lambda_3$ 
  - Cable operators do not want to have multiple 25G ONU's with different, fixed wavelength pairs – operationally difficult to manage multiple part number for different colors.
  - When cable operators offer higher data rate services that would require additional wavelength pairs  $\lambda_1, \lambda_2, \lambda_3$ , price is not as sensitive which may justify costs of tunable optics and/or multiple lasers & APD's
  - Alternatives to 25G ONU (25G ASIC) on single, fixed Wavelength Pairs  $\lambda_1, \lambda_2, \lambda_3$  :
    - Use 25G ONU (25G ASIC) with tunable laser/tunable Rx filter for 3 wavelengths ( $\lambda_1, \lambda_2, \lambda_3$ )?
    - Use 25G ONU (25G ASIC) with tunable laser/tunable Rx filter for 4 wavelengths ( $\lambda_0, \lambda_1, \lambda_2, \lambda_3$ )?
    - Use 25G ONU (25G ASIC) with multiple fixed lasers and Rx's for 3 wavelengths ( $\lambda_1, \lambda_2, \lambda_3$ )?
    - Use 25G ONU (25G ASIC) with multiple fixed lasers and Rx's for 4 wavelengths ( $\lambda_0, \lambda_1, \lambda_2, \lambda_3$ )?
    - Use 50G ONU (50G ASIC) for 25G utilizing only 1 wavelength ( $\lambda_0$  or  $\lambda_1$ )?
    - Use 100G ONU (100G ASIC) for 25G utilizing only 1 wavelength ( $\lambda_0, \lambda_1, \lambda_2$ , or  $\lambda_3$ )?
  - Does standard need to specify or leave it to the market to determine?
- ◆ Does 50G ONU always utilize  $\lambda_0$  and  $\lambda_1$ ?

# 25G ONU's: 25G ASIC + 25G Optics on 4 different wavelength pairs



- 25G ASIC
- Total Throughput on PON Segment = 100Gb/s
- Max Data Rate per ONU = 25Gb/s
- ONU Return Laser options:
  - 1 laser on Fixed wavelength, need 4 ONU part numbers, lowest cost
  - 1 tunable laser, only 1 ONU part number, cost higher
  - 4 lasers on Fixed wavelength (only 1 active), only 1 ONU part number, cost highest
- ONU Downstream Rx options
  - 1 APD with fixed filter
  - 1 APD with tunable filter
  - 4 APD's (only 1 used)