Security Level:

# 100G EPON Coexistence discussion

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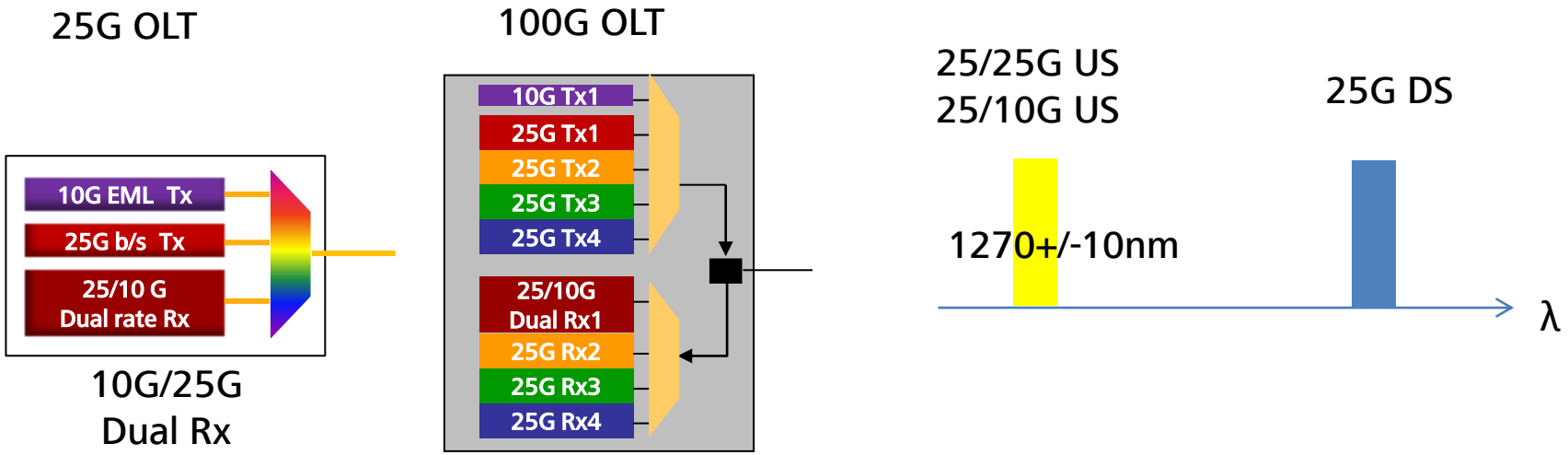
# Background

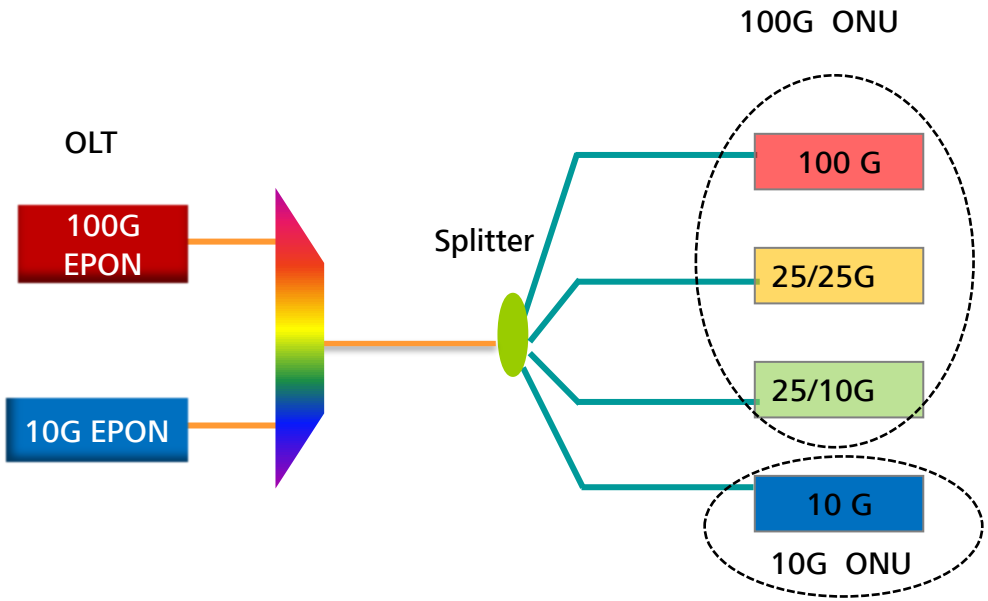
- What method of coexistence is used for 10GEPON is an important factor for the decision of wavelength plan.
- 3 channels of 100G EPON will certainly coexist with 10G EPON by WDM. The only decision is how 25G coexists with 10G.
- Considering both symmetric and asymmetric, there are at least 3 possible coexistence options:
  - Option 1: 25/25, 25/10, & 10/10 use a same upstream wavelength, TDM coexistence
  - Option 2: 25/25 & 25/10 use a same upstream wavelength, WDM coexistence with 10/10
  - Option 3: 25/10 & 10/10 use a same upstream wavelength, TDM coexistence, 25/25 uses another upstream wavelength, WDM with 10/10G

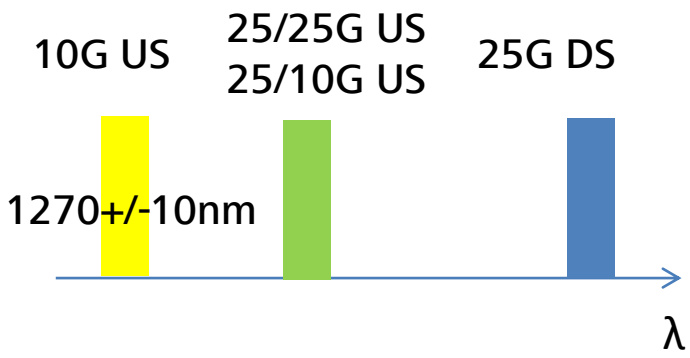
# Option 1: TDM coexistent




- 25/25, 25/10 & 10/10G all coexist by TDM.
- Main concern:
  - Low upstream bandwidth efficiency, DBA is complicated.
  - 10G optics are re-done in 25G and 100G, this make the 25G and 100G OLT optics quite complex

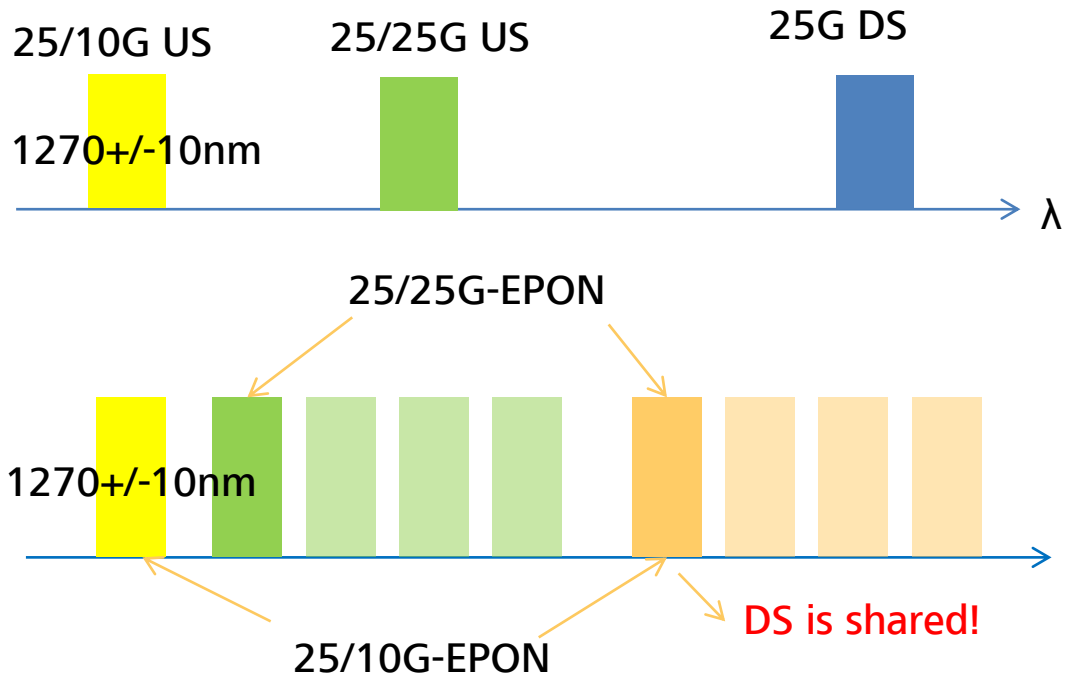
# Option 2: WDM coexistent




- 100G PON (including 25G) coexists with 10G PON by WDM
- 100G PON and 10G PON are two independent systems, upgrade simplicity
- Main concern:
  - 25/10G needs a new type 10G upstream transmitter, can't re-use the existing 1270nm transmitter in 10G PON.

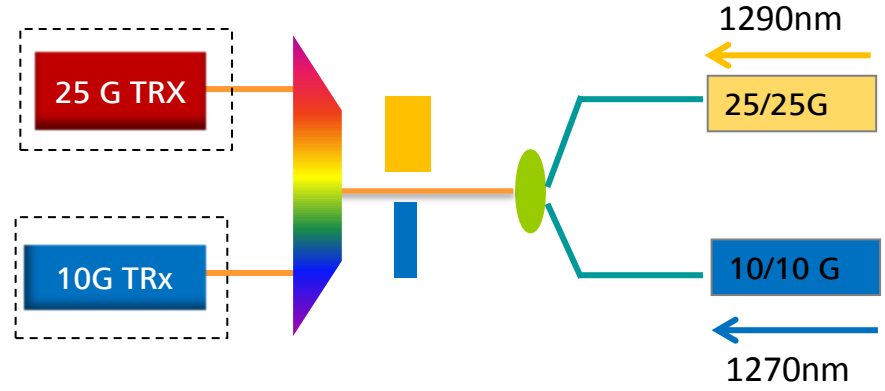
# Option 3: TDM & WDM hybrid coexistent



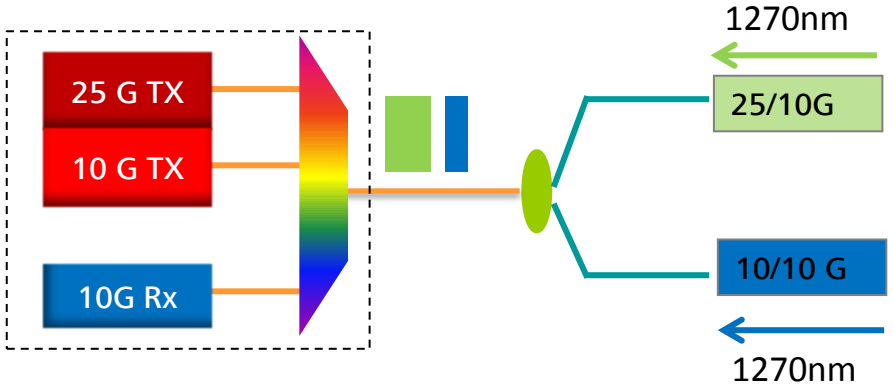

- 100G and 25G symmetric system coexists with 10G by WDM
- 25/10G coexists with 10G PON by TDM
- 25/25 and 25/10G coexists by TDM? Or WDM?

# Option 3:  2 type ONUs coexistent

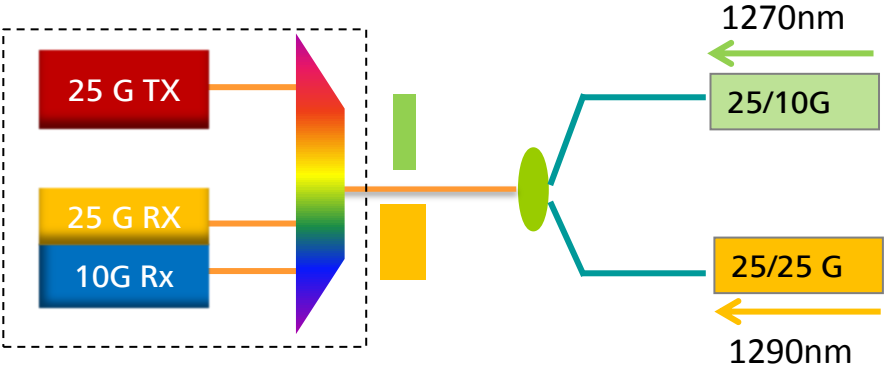
25/25G & 10/10G  WDM



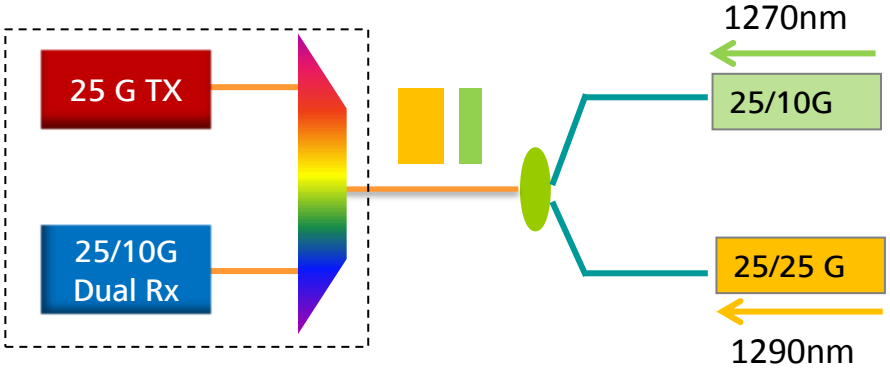

25/10G & 10/10G  TDM




25/25G & 25/10G  WDM

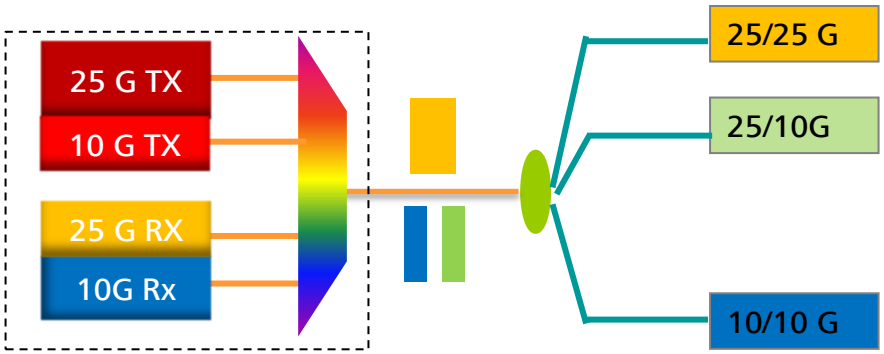



25/25G & 25/10G  TDM



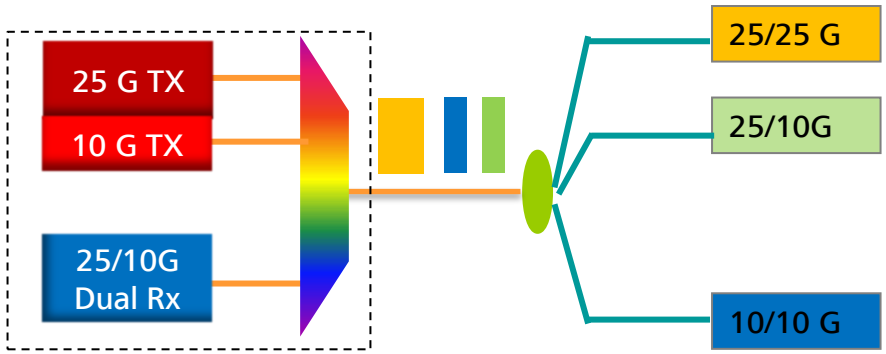
# Option 3:  3 type ONUs coexistent

25/25G, 25/10G & 10/10G  WDM




Quadr-plexer OLT module

25/25G, 25/10G & 10/10G  TDM




Triplexer OLT dual rate module

- OLT architecture depends on coexistence scenario
- Complex optics in OLT are required for 3 type ONU coexistence, as DBA can't go across OLT boards.

# Discussion

- If we want to re-use existing 1270nm 10G optics for 25/10G, then TDM and complex 100G EPON OLT optics seem to be indispensable.
- If we want to uncouple “100G EPON” & “10G EPON”, WDM coexistence, option 2 is the best choice, then we need to re-consider the following motion.

**Motion #3**
The P802.3ca standard shall enable an implementation using a single wavelength pair operating at 25Gbps symmetric. The P802.3ca standard shall enable an implementation using a single wavelength pair operating at 25/10Gbps asymmetric (reusing 10G-EPON US).
Moved: Jorge Salinger Seconded: Kevin Noll
For: 18 Against: 0 Abstain: 2
Technical ≥ 75%Passed

# Discussion

- From the upgrade simplicity and coexistent flexibility considerations, WDM coexistence between 10G EPON and 100G EPON is a better choice:
  - Upstream bandwidth efficiency is higher
  - WDM coexistence can support more co-existence scenarios, as 100G EPON is uncoupled from 10G EPON.
  - 100G EPON OLT optics will be much simpler in WDM coexistence.
- The cost of using another wavelength 10G transmitter other than 1270nm is not substantial if it's close in spectrum (such as in 1290nm or ~ 1300nm)

# Straw poll:

- I prefer 25G symmetric EPON coexist with 25G asymmetric EPON by
  1. TDM ?
  2. WDM ?

# Straw poll:

- I prefer:

  1. 25G symmetric/asymmetric EPON coexist with 10G EPON  by TDM ?
  2. 25G symmetric/asymmetric EPON coexist with 10G EPON  by WDM ?
  3. 25G symmetric EPON coexists with 10G EPON by WDM, 25G asymmetric EPON coexists with 10G EPON by TDM ?

# Thank you

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