Views on a two-option wavelength plan

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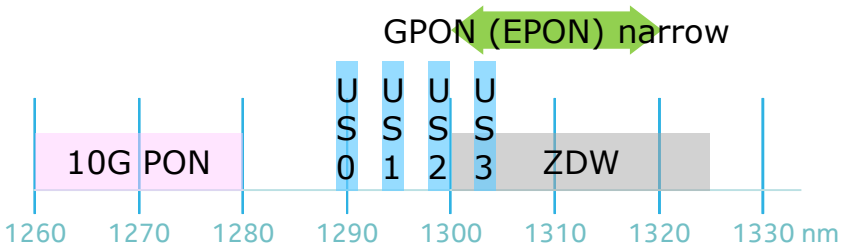
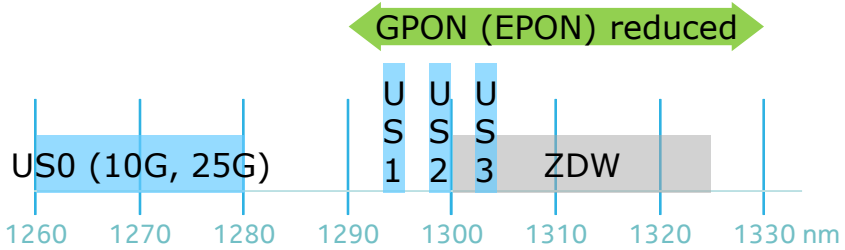
Two-option wavelength plan

Following liudekun_3ca_2_0517.pdf

- Two upstream options:





"**Plan A**" option:

- ✓ WDM coexistence of 100G US with 10G/10G EPON (.3av), 10G/1G PON (CTC), XG-PON1, and XGS-PON
- ✓ WDM coexistence of 50G US with EPON and GPON using "narrow" band

"**Plan B**" option:

- ✓ WDM coexistence of 25G US with EPON and GPON using "reduced" band
- ✓ Expected to be lower cost than Plan A

- Operators who require WDM co-existence with 10G EPON will specify "Plan A" in RFQs and vendors will build it. **These operators will get exactly what they want.**
- Operators who require the lowest cost solution and/or GPON co-existence (and without 10G EPON ONUs on the same ODN) will specify Plan B and vendors will build it. **These operators will get exactly what they want.**

Cost of "splitting" the optics market?

- **Scenario 1**: Operators advocating "Plan A" are correct. All operators will require Plan A. Vendors only build Plan A. Therefore no split in the market.
  - "Splitting the market" is a non-issue
- **Scenario 2**: Some operators ask for "Plan A" and some ask for "Plan B". This will "split the market". Is this a bad outcome?
  - In this scenario, there are two different sets of operator requirements, and it is proper for there to be two different solutions
  - What is the cost of "splitting the market"?
  - Component vendors need to create two upstream 25G PON lasers, one at 1270 nm and one at ~1290 nm. However, this will only add a small cost (next slide).
- **Scenario 3**: 802.3ca selects "Plan A". ITU-T standardizes 25G PON. ITU-T requires co-existence with GPON (presumably the "reduced" 1290-1330 nm upstream), and chooses Plan B.
  - Therefore the market would be split if IEEE chooses Plan A anyway.
- Any operator concerned about managing two ONU codes will procure only "Plan A" or "Plan B" ONUs.
- **The adverse consequences of choosing the two-option plan are zero (Scenarios 1 and 3) or minimal (Scenario 2) at most.**

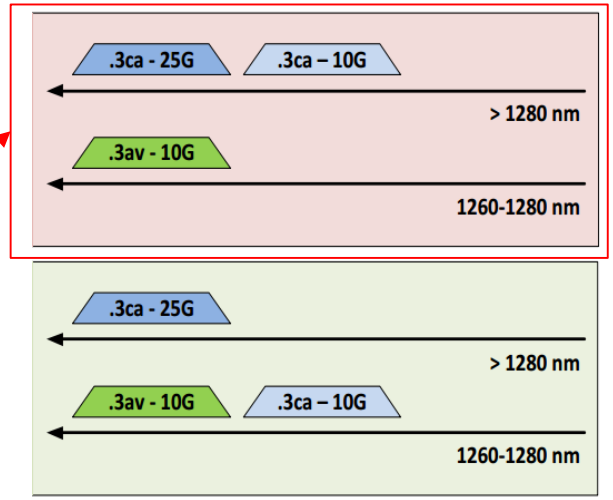
Supporting 1270 and 1290 nm lasers

Compared to one wavelength option, the added costs of supporting two wavelengths are small:

- Development costs: 2x fabrication, characterization and qualification of development wafers. A small fixed cost when amortized over years of production
- No impact on variable manufacturing cost
- Manufacturing set-up and finished goods inventorying of two product codes instead of one. On the order of a couple percent.

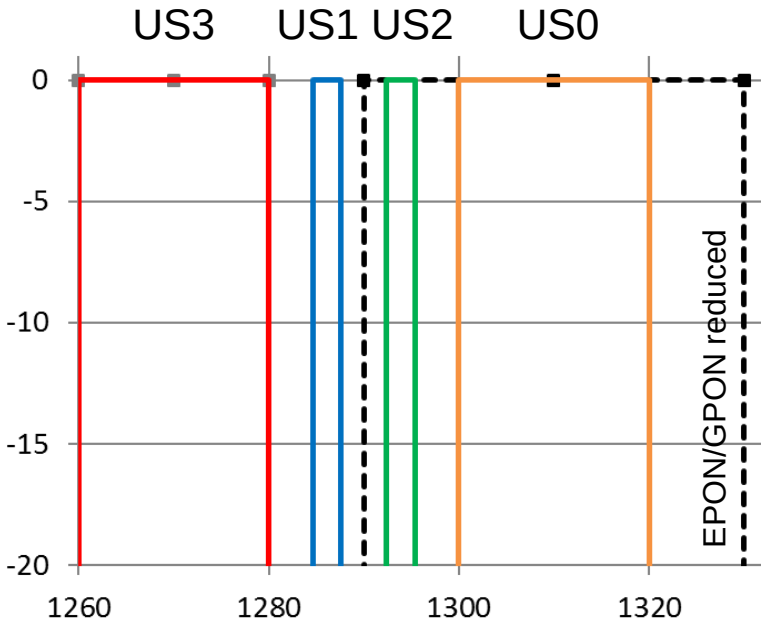
Mixed DBA not required

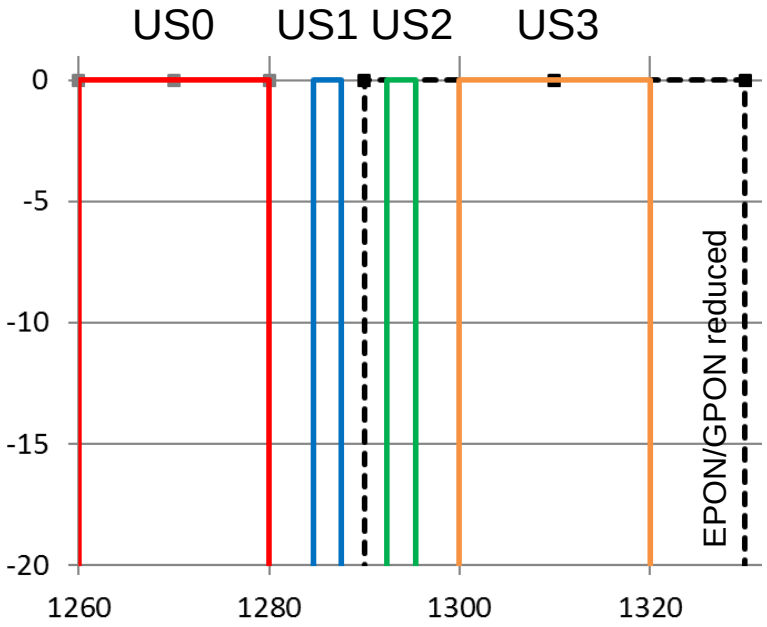
- The complexity of supporting mixed DBA (as described in kramer_3ca_2_0517.pdf) can be avoided
- The "Plan B" option is not required to support TDM co-existence with 10G EPON. "Plan B" to only be deployed on ODNs without 10G EPON ONUs (greenfield ODNs or WDM co-existence with other PON technologies, e.g. GPON)
  - 25/25 and 25/10 ONUs are in the same upstream time domain, but both use .3ca data formatting and FEC
  - No need for a triple rate receiver in the CTC case. CTC would use the "Plan A" option.
- "Plan A"
  - Two places to place .3ca 10G US channels, per kramer_3ca_2_0517.pdf
  - Placing .3ca 10G US at US0 removes the need for mixed DBA



Applied to Plan EO (simplified version)

Following effenberger_3ca_1_0717





"**Plan A**" option:

- ✓ WDM coexistence of ~~100G~~ 75G US with 10G/10G EPON (.3av), 10G/1G PON (CTC), XG-PON1, and XGS-PON
- ~~✓ WDM coexistence of 50G US with EPON and GPON using "narrow" band~~

"**Plan B**" option:

- ✓ WDM coexistence of 25G US with EPON and GPON using "reduced" band
- ~~✓ Expected to be lower cost than Plan A~~

Outlook

- No one in the Task Force has a perfect view of network requirements in 2020, let alone 2025.
- There are many potential 25/50/100G EPON operators who do not attend 802.3ca (hopefully that is the case!). Many of those might have GPON in their networks.
- A two-option plan will not limit deployment of 25/50/100G EPON but will extend its addressable market.