.3ca 10G US channels in greenfield

Ed Harstead, Nokia

Background

- In the July 802.3ca meeting we passed a motion (#5) that says:

  802.3ca shall adopt an upstream wavelength plan for the first 25G and new 10G (EQ based) channel with two options, Option 1: at 1310nm width 20nm; WDM coexistent with 10G-EPON Option 2: at 1270nm width 20nm; WDM coexistent with G-PON reduced wavelength set. TDM coexistence with legacy PONs is not required (this includes 10G EPON).

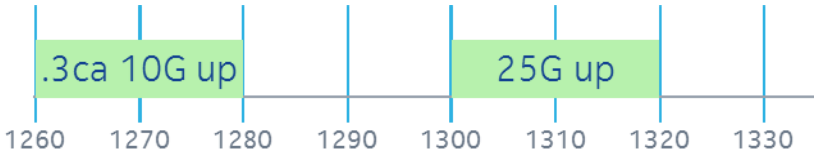
- This addresses two brownfield applications:
  - WDM co-existence with 10G PONs:

  - WDM co-existence with GPON and EPON (reduced)

- In both cases, the .3ca 10G US channel is on the same wavelength as the 25G US channel. To support both 25/10 and 25/25 ONUs on the same ODN, OLTs will need a dual rate OLT receiver and DBA, resulting in a variable total US capacity between 10 and 25 Gb/s.

Upstream channels in greenfield

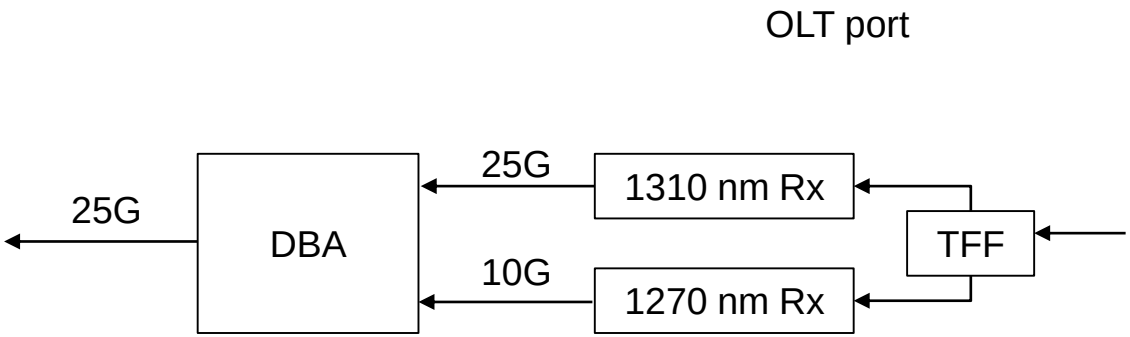
- In greenfield, operators would have the choice of deploying either of the two options, 1270 nm up or 1310 nm up.
- This can be optimized for greenfield. Since we have two US wavelengths at our disposal, we can use one for 25G US and one for .3ca 10G US. It looks like:



- (The wavelengths could be switched around, but we already have 10G ONU lasers at 1270 nm so let's only have this one for greenfield).
- There is a large advantage: when supporting 25/10 and 25/25 ONUs on the same ODN, variable US capacity, that some operators dislike, is avoided. The total US capacity is constant 35 Gb/s (10 Gb/s + 25 Gb/s).

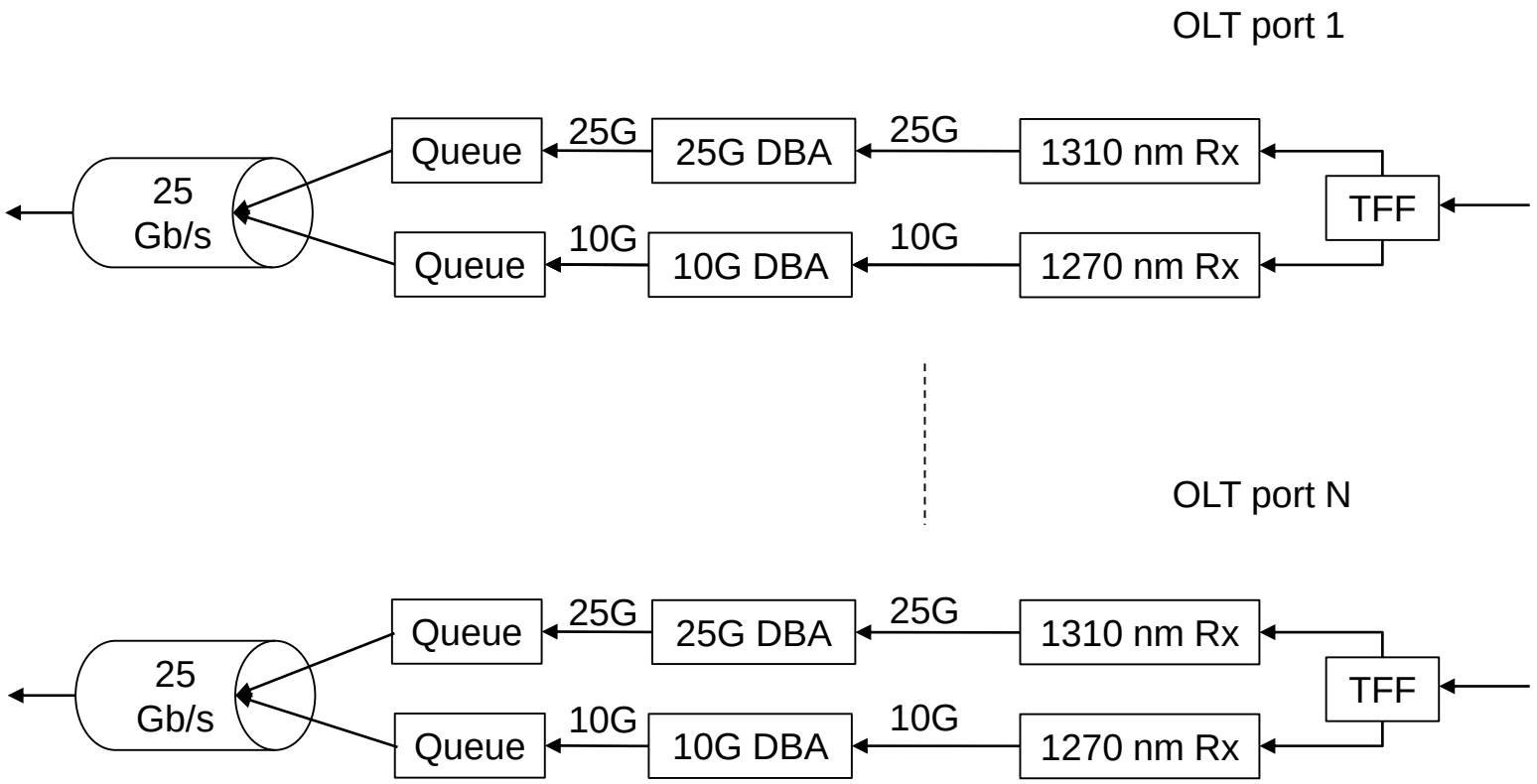
Addressing "weird" 25G/35G, 1/3

Implementation 1: For each OLT port, a single DBA controls two time domains (i.e. allocates grants) such that total upstream PON capacity is always 25G, no more and no less.



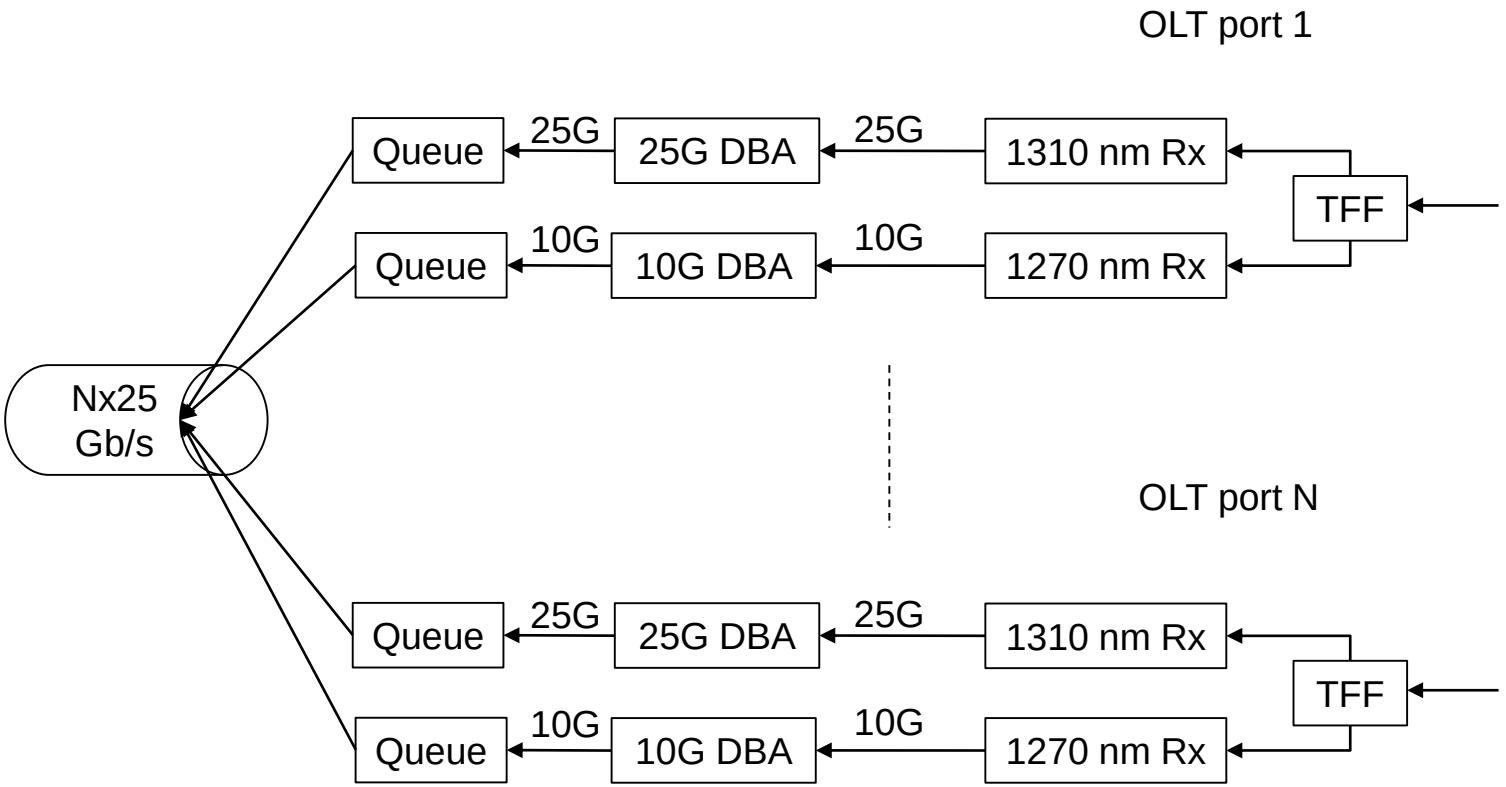
Addressing "weird" 25G/35G, 2/3

Implementation 2: Each OLT port has two independent 25G and 10G DBA time domains. Concentrate each upstream OLT port to maximum 25 Gb/s.



Addressing "weird" 25G/35G, 3/3

Implementation 3: Each OLT port has two independent 25G and 10G DBA time domains. . Concentrate each upstream OLT port to maximum Nx25 Gb/s.



Motion

The standard shall specify the following three upstream wavelength plans for the first 25G and new .3ca 10G upstream channels:

- Plan BfX: wavelength plan targeting Brownfield deployments coexisting with 10Gb/s PONs (10G-EPON, XG-PON1, and XGS-PON): 1300-1320 nm for .3ca 10G and 25G upstream (dual-rate)
- Plan BfG: wavelength plan targeting Brownfield deployments coexisting with GPON: 1260-1280 nm for .3ca 10G and 25G upstream (dual-rate)
- Plan Gf: wavelength plan targeting Greenfield deployments and supporting separate wavelengths for 25Gb/s and 10Gb/s upstream: 1260-1280 nm for .3ca 10G upstream and 1300-1320 nm for 25G upstream