Wavelength Plan for Greenfield

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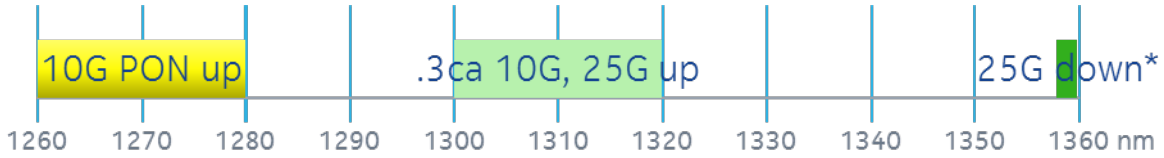
Background

- 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:
  - **"Brownfield coexisting with 10G-PON" (BfX):**

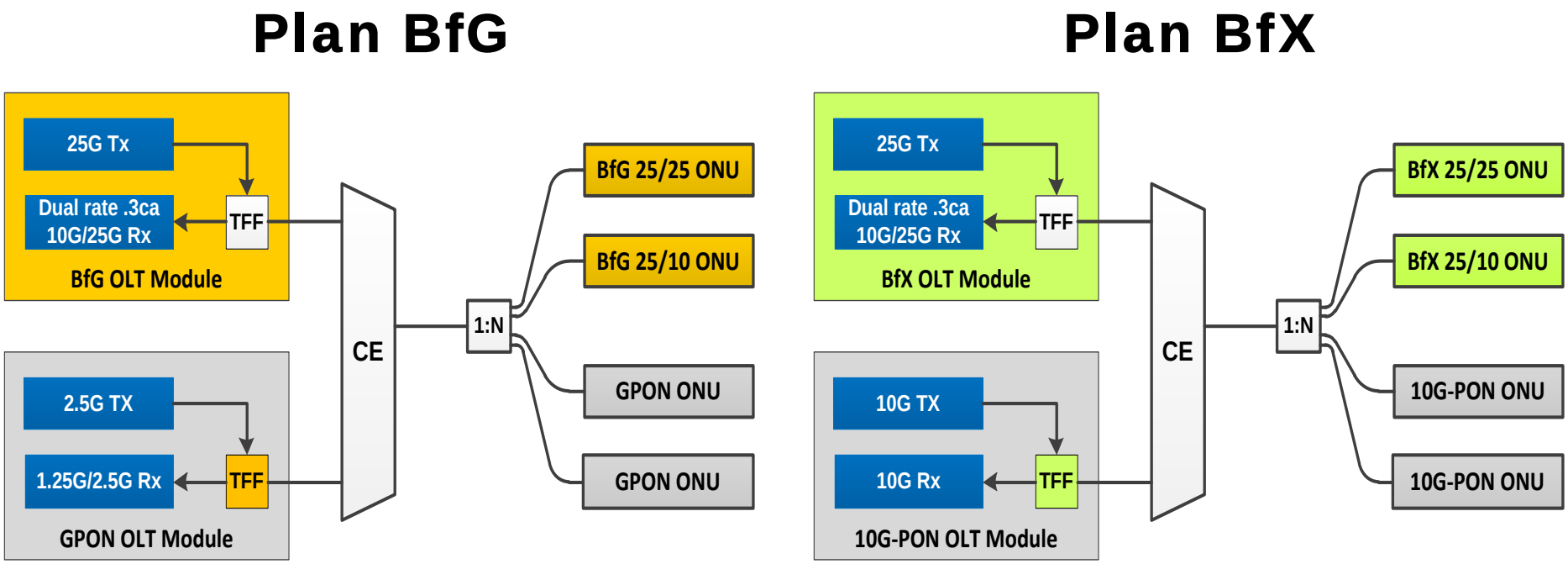


*25G down in O+ band, specific wavelength is t.b.d.

  - **"Brownfield coexisting with GPON and EPON (reduced)" (BfG):**

- 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.

Coexistence Scenarios

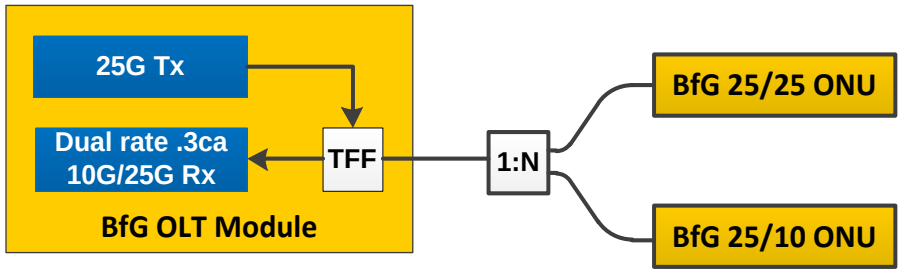


- The BfG and BfX OLT Modules have the same transmitters and receivers, just different filters.

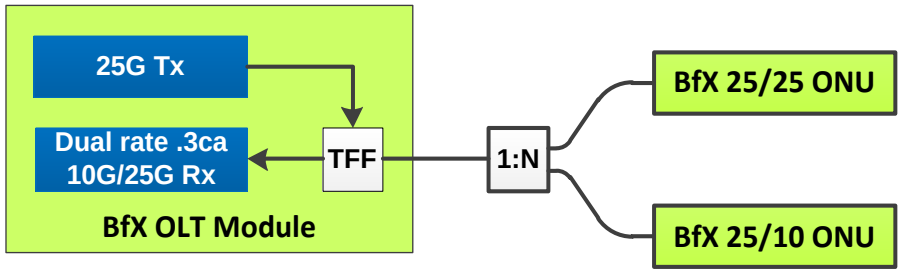
Greenfield Scenarios

- The same BfG and BfX OLT Modules can be used in greenfield deployments.

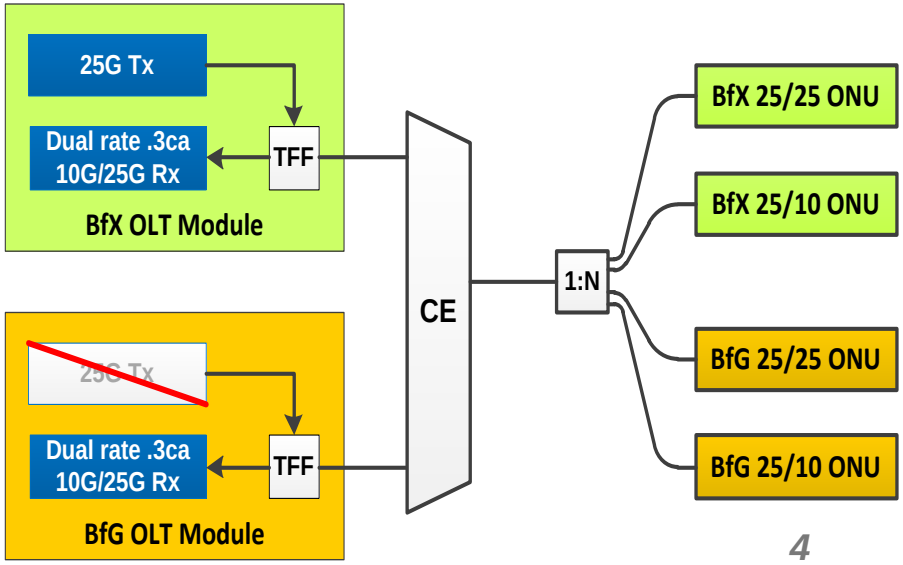
Plan BfG



Plan BfX



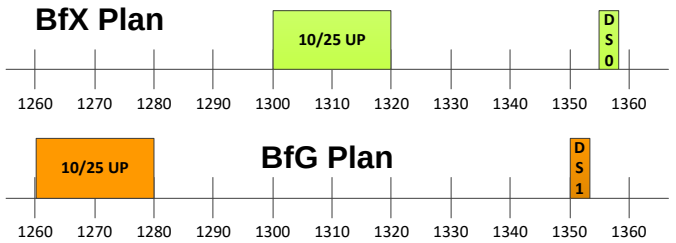
- But what about both plans together?
  - Double the upstream BW
  - An operator may decide to use BfG plan with all 25/10 ONUs and BfX plan with all 25/25 ONUs, eliminating dual-rate TDM coexistence.
  - This requires disabling one 25G Tx port and routing all traffic through the other Tx port



A better Greenfield Solution

- Once we specify different wavelength plans, BfG and BfX, having the same downstream wavelength is not important so much

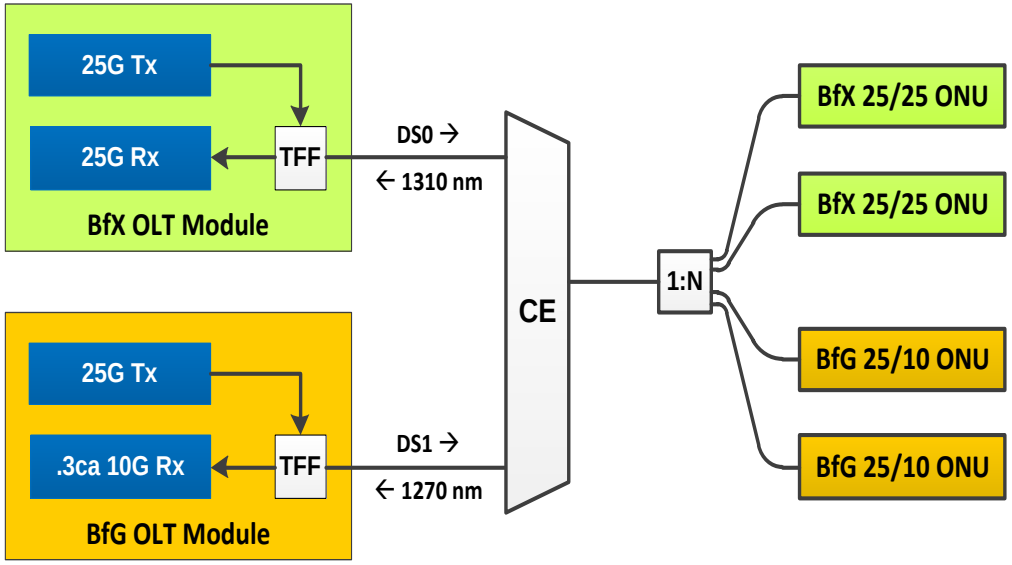
- **Proposal:**
  - Use DS0 for downstream Tx in BfG plan
  - Use DS1 for downstream Tx in BfX plan



- This makes no difference for any brownfield coexistence scenario.

- In greenfield, each plan still can be used on its own.

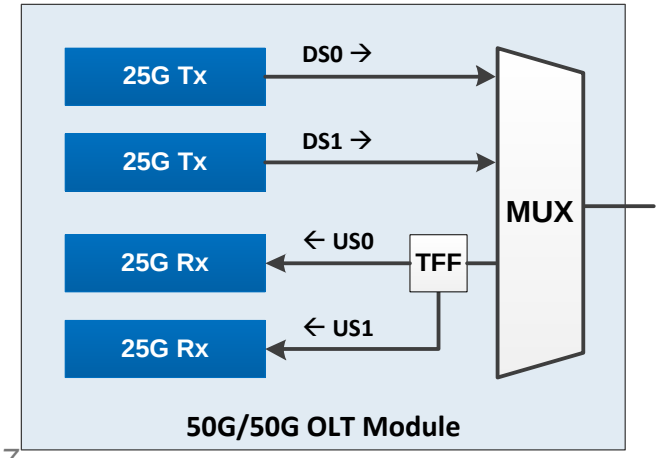
- But in case of both plans being used together, it allows a complete separation of upstream and downstream channels among BfG and BfX ONUs.

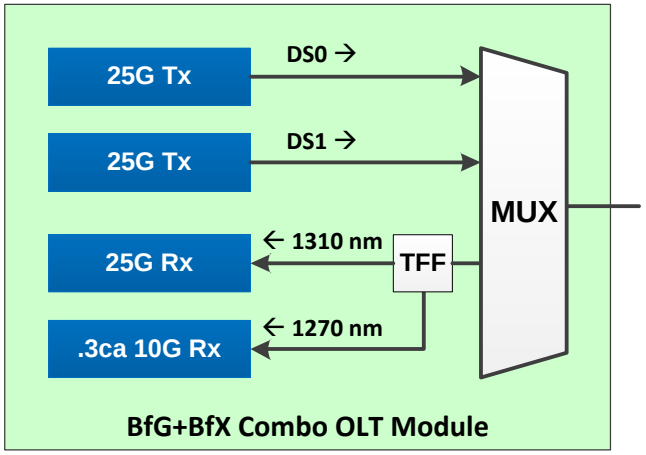


Advantages

- Doubles upstream and downstream capacities
- No changes to SoC beyond what is already required for Brownfield
- Allows operators to deploy 25/10 and 25/25 ONUs using full WDM coexistence (eliminates the need for dual-rate TDM)
- Each Rx path can be a single rate instead of double rate. This should improve sensitivity and lower the cost.

- In the future, when 50G/50G OLT module becomes feasible (2x25G), so it will be feasible to combine both BfG and BfX plans into a single module
  - Downstream – identical to 50G/50G OLT module
  - Upstream – only TFF is different





Optical Module Evolution

- We may start with two plans for 25G optics (BfG and BfX)
- At 50/25 and 100/25, downstream components become identical
- At 50/50, 100/50, and 100/100, the two plans merge into one