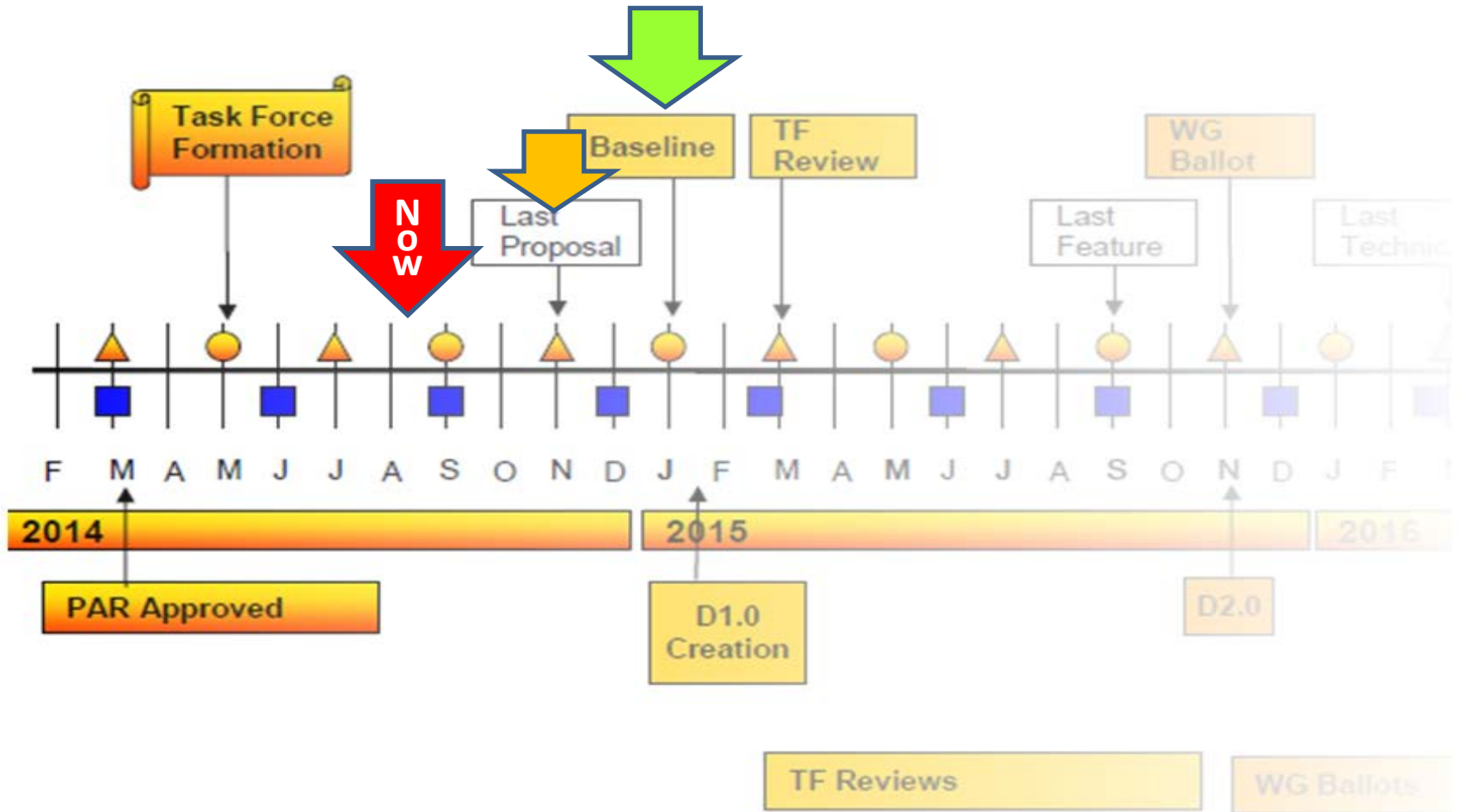


400G MMF PMD options: working towards a baseline proposal

8th August 2014

Jonathan King, Finisar

Our adopted timeline



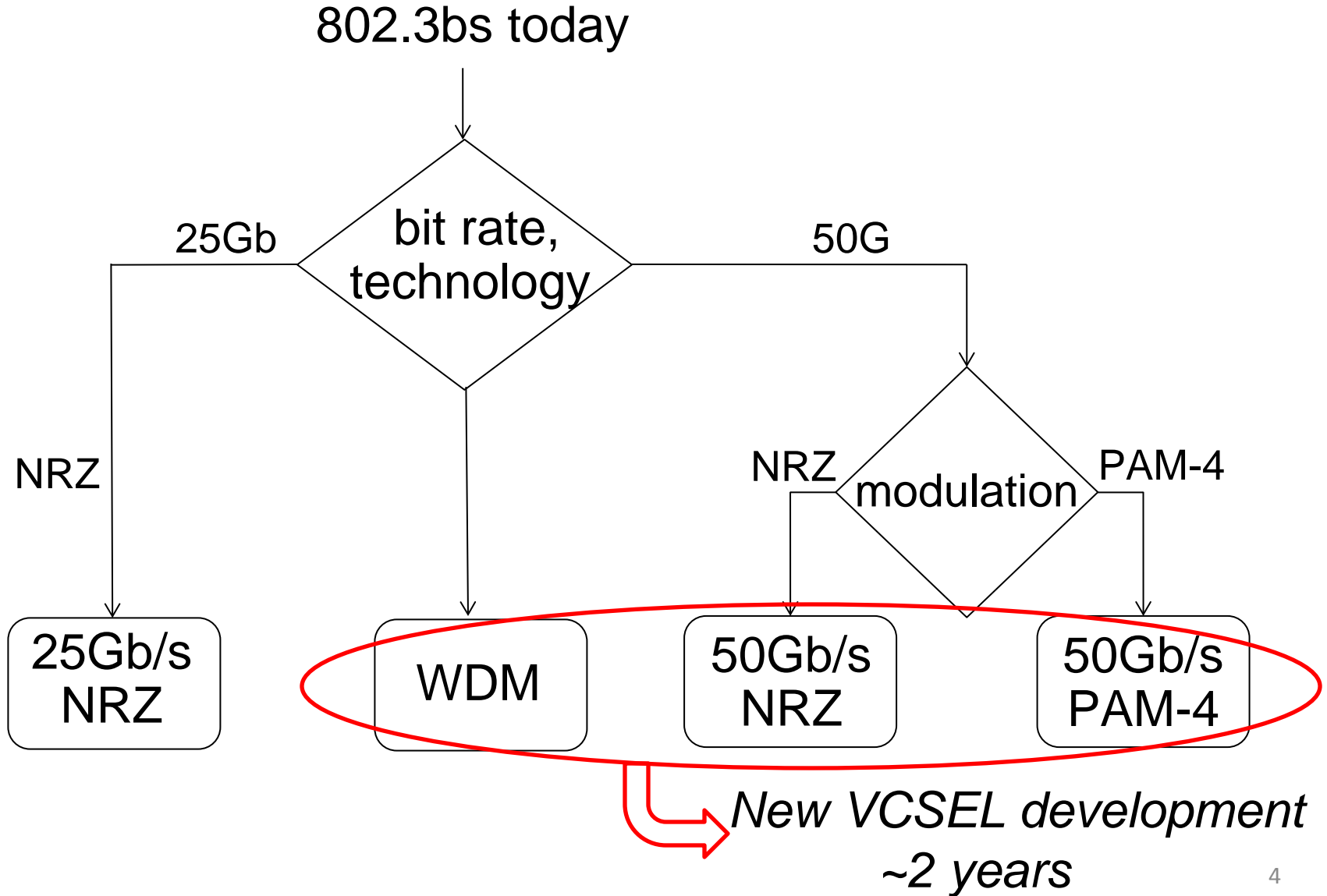
- 3 months to Last Proposal
- 5 months to Baseline tempus fugit

Thoughts on baseline proposals for 400G MMF PMDs

Baseline proposals based on:

- 16 x 25 Gb/s
 - No new devices
 - Baseline could be written now, drawing on 100GBASE-SR4
 - Compatible with a 16 x 25Gb/s electrical interface
 - Compatible with early adopter breakout applications.
- 8 x 50 Gb/s
 - Link budget comparison (ref: [king_02_0614](#)) of 50 Gb/s per VCSEL options showed that both NRZ and PAM4 modulation formats are potentially feasible, but *each requires the development of new VCSELS*.
 - Significantly faster VCSEL for NRZ (~10 ps rise fall time),
 - Significantly better VCSEL RIN for PAM4
 - -148 dB/Hz, compared to ~-140dB/Hz for a good current generation VCSEL
 - better rise fall-time to reduce transmitter and fiber ISI penalties to below 4dB
 - Higher output power to meet added link budget needed for PAM4
- WDM
 - A potential technology add-on option to reduce fiber count
 - *Requires the development of new VCSEL wavelengths*
 - Fiber bandwidth, VCSEL wavelengths, and eye safety implications need further study

Implication for decision tree for 400Gb/s on MMF



Concluding remarks

- A 400 Gb/s MMF PMD baseline proposal for this project should be based on a 16 x 25 Gb/s solution.
 - Proposals based on 8 x 50 Gb/s, while potentially technically feasible, need the development of next generation VCSELs.
 - Proposals including short wavelength WDM, while potentially technically feasible, would need new VCSL wavelengths to be developed, and the resolution of fiber bandwidth, eye safety and wavelength plans.
 - These may be more appropriate for a later 'next gen 400G' project