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Wavelength plan comparison: weighting

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Scope

- At the September meeting we considered a quasi-quantitative model for comparing wavelength plans, harstead_3ca_4b_0916.pdf
- That model identified criteria for comparing plans, and weighted all the criteria equally for simplicity.
- In this document:
  - Updated criteria are proposed. There are some additions and clarifications. And some subtractions where there is no differentiation among remaining plans A, B, C, D.
  - Weighting of criteria is required for a more sophisticated evaluation. Weights are proposed and explained. Weighting is done separately for 25G and 100G. When scoring the plans, the relative weights of 25G and 100G can be normalized.

Relative weighting of criteria for 25G PON

criteria	Allow uncooled 25G DML in ONU	O-band laser in OLT	OLT does not require a 10G Rx	No dispersion compensation >10km	duplex fiber OLT optical module (for one-direction DCF)	25G US λ0 doesn't share capacity with 10G
unnormalized weights	2	1.5	1	1	0.5	1.5
explanation	Biggest cost lever in 25/25 ONUs. For PR20, but for PR30 is t.b.d.	Leverage data center ecosystem. Probably lower cost and faster time to market.	Demux and 10G Rx affects size, power, cost.	Importance will vary by operator. But where required it will add cost and operational complexity.	Doubles fiber management.	10G upstream ONU traffic takes capacity from 25G

Relative weighting of criteria for 100G PON, 1/2

criteria	O-band laser in ONU	O-band laser in OLT	All uniform passbands for AWG	All narrow passbands for 25G upstream	EDFA option: upstream
unnormalized weight	5	1	1	1	2
explanation	Leverage data center ecosystem. Probably lower cost and faster time to market. Higher weight than for OLT.	Leverage data center ecosystem. Probably lower cost and faster time to market.	Allows for single AWG demux and single AWG mux implementation	Requires a wide passband for 25G: will be more susceptible to SOA preamp ASE	It's possible that an SOA preamp will not give the required performance.

Relative weighting of criteria for 100G PON, 2/2

EDFA option: downstream	OLT does not require a 10G Rx	OLT does not require a 10G EML Tx	No dispersion compensation >10km	Don't require duplex fiber OLT optical module (for one-direction DCF)	25G US λ0 doesn't share capacity with 10G
1	1	2	3	1.5	3
It's possible that an SOA postamp will not give the required performance (less likely than for preamp)	Demux and 10G Rx affects size, power, cost.	To support 10G EPON ONUs on same ODN. 10G EML Tx and mux affect size, power, cost.	Importance will vary by operator. But where required it will add cost and operational complexity.	Doubles fiber management.	10G upstream ONU traffic takes capacity from 25G. Proportionally smaller effect for 100G than for 25G.


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