

Optical Link Budget Implications for 10km SMF Reach Objective

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Background

- HSSG 100GE SMF reach objectives
 - 10km
 - 40km
- 10km objective was approved in 2006 as a single SMF reach
- 40km objective was approved in 2007 as a second SMF reach
- Optics analysis has shown 100GE 4x25G SMF technology cost knee is below 10km, unlike for 10GE 1x10G SMF technology
 - Higher noise bandwidth due to 25GBaud versus 10GBaud
 - Additional losses through 4 λ WDM Mux and DeMux
- End user input has shown that most 100GE SMF Data Center & Enterprise applications are covered by reaches below 10km
 - High percentage are covered by 2km
 - Remainder are covered by 3km or 4km

4x25G SMF PMD Link Budget

	3km	4km	10km
Fiber Loss	1.2	1.6	4.1
Connector Loss	2.0	2.0	2.0
Penalties (CD, Xtalk,)	2.1	2.2	2.7
Total budget	5.2	5.8	8.8

- There is a large cost delta between 3km/4km and 10km
- There is some cost delta between 3km and 4km
- Penalty values are approximate and further work is required to accurately reflect all impairments and λ grid

Discussion

- 10km reach versus 3km/4km reach requires:
 - Higher output power EAM-DFBs
or higher output power DM-DFBs
 - Higher sensitivity PIN receivers
- 3km reach versus 4km reach
 - 3km has some cost advantage and is aligned with a standard (TIA)
 - 4km addresses some high end data center applications
- Recommend that 10km reach be changed to 3km or 4km
 - 10km reach applications addressed by the 40km reach
- Request end user input on importance of 3km versus 4km reach