

Simplified Loss Budget Definitions

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Try to base budget on established stds

- The ITU-T G.652 fiber spec suggests that 0.5 dB/km is a good planning value for installed cabled fiber (at 1260nm)
 - Typically, the fiber itself is considerably better than this
 - This includes typical splicing losses, and all other loss aspects
- ITU-T G.671 fiber component spec suggest 0.5 dB as worst case connector loss
 - Typically, connectors are significantly better than this, so there is margin hidden inside of this number

Proposed losses for our distance objectives

- BR10: $10 * 0.5 + 4 * 0.5 = 7$ dB (a bit harder than LR specs)
- BR20: $20 * 0.5 + 6 * 0.5 = 13$ dB (a bit easier than ER specs)
- BR40: $40 * 0.5 + 6 * 0.5 = 23$ dB (a lot harder than ER spec)
- Question: can we agree to use these budgets?

- One side issue is 10G BR40: We could operate in the C-band
 - The C-band loss is 0.35 dB/km
 - This would make the loss budget $40 * 0.35 + 6 * 0.5 = 17$ dB
 - 17 dB is actually a bit easier than ER
- Question: do we want to go for 10G BR40 in the c-band?
 - E.g., Downstream 1570 nm, upstream 1510 nm

Loss budgets for existing LR, ER PHYs

Budget parameters	10 Gb/s	25 Gb/s	50 Gb/s
LR Tx Average power (min)	-8.2	-7	-4.5
LR Rx Average power (min)	-14.4 (BER 1E-12)	-13.3 (BER 5E-5)	-10.8 (BER 5E-5)
Budget	6.2	6.3	6.3
ER Tx Average power (min)	-4.7	-3	0.4
ER Rx Average power (min)	-15.8 (BER 1E-12)	-21 (BER 5E-5)	-17.6 (BER 5E5)
Budget	10.9	18	18
PR Tx Ave. power (min)	2 / 5	0.6 / 2.9	
PR Rx Ave. power (min)	-19 / -27 / -28 (BER 1E-3)	-23.4 / -26.2 (BER 1E-2)	
Budget	20 / 24 / 29 / 33	24 / 29	

Potential budgets for BR10, BR20, BR40

Budget parameters	10 Gb/s		25 Gb/s	50 Gb/s
BR10 Tx Average power (min)	-7.4		-6.3	-3.8
BR10 Rx Average power (min)	-14.4 (BER 1E-12)		-13.3 (BER 5E-5)	-10.8 (BER 5E-5)
Budget	7		7	7
BR20 Tx Average power (min)	-1.4		-8	-4.6
BR20 Rx Average power (min)	-14.4 (BER 1E-12)		-21 (BER 5E-5)	-17.6 (BER 5E5)
Budget	13		13	13
BR40 Tx Average power (min)	1	2.6	+2	+5.4
BR40 Rx Average power (min)	-22? (BER 1E-12)	-14.4	-21 (BER 5E-5)	-17.6 (BER 5E5)
Budget	23	17	23	23
	O-band	C-band		