Loss Budget Discussion

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Operator input

- Fabrice Bourgart (Orange) has provided the following design rule aspects to consider
  - Connectors: 0.35dB each
  - Splices: 0.1dB each
  - Fibre: 0.47 dB/km
  - Repair/ageing margin: 1dB
- Also, guidelines on the usage of these
  - 6 connectors per link
  - 1 splice per km

Proposed losses for our distance objectives

- 10 km = 8.8 dB
- 20 km = 14.5 dB
- 40 km = 25.8 dB
  - Note: Fabrice reports that 25 dB would be sufficient

- Also interest in merging 10 km and 20 km into a single class
  - Question: What do we save by going from ~15dB budget down to ~9 dB?

Naming

- Previously, we had suggested the following PHY names
  - 10GBASE-BLR, BMR, BER
  - 25GBASE-BLR, BMR, BER
  - 50GBASE-BLR, BMR, BER
- This makes sense if the loss budgets are the same as the “L” and “E” links; however, if they are different...
- Another possibility would be to follow the BX10 and BX20 names
  - 10GBASE-BR10, BR20, BR40
  - 25GBASE-BR10, BR20, BR40
  - 50GBASE-BR10, BR20, BR40

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	

Possible budgets for BR20, BR40

Budget parameters	10 Gb/s	25 Gb/s	50 Gb/s
BR20 Tx Average power (min)	0.6	1.7	4.2
BR20 Rx Average power (max)	-14.4 (BER 1E-12)	-13.3 (BER 5E-5)	-10.8 (BER 5E-5)
Budget	15	15	15
BR40 Tx Average power (min)	3	4	6.4
BR40 Rx Average power (max)	-22 (BER 1E-12)	-21 (BER 5E-5)	-17.6 (BER 5E-5)
Budget	25	25	25

- BR20 seems achievable using PIN detectors and reasonable Tx powers; therefore, there seems not much motivation to do a separate BR10 budget
- Budgets for 10G and 25G are very close, suggesting that these could be unified

Rationalized budgets for BR20, BR40

Budget parameters	10 Gb/s	25 Gb/s	50 Gb/s
BR20 Tx Average power (min)	1	1	4
BR20 Rx Average power (max)	-14 (BER 1E-12)	-14 (BER 5E-5)	-11 (BER 5E-5)
Budget	15	15	15
BR40 Tx Average power (min)	3	3	6
BR40 Rx Average power (max)	-22 (BER 1E-12)	-22 (BER 5E-5)	-18 (BER 5E-5)
Budget	25	25	25