Technology Exploration Forum

100G/400G PAM4 Modulation

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Higher Order Modulation for Data Center

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- Increasing data rate from 100G → 400G for the data center requires:
  - Single Mode Fiber: 100m → 500m
  - Modulation Speed: 28G → 56G
  - Higher Order Modulation: NRZ → PAM4
  - Parallel Fibers: 2 → 8

100G/400G Solution Comparison

Solution	100G Wavelengths	Power	Relative Cost	400G	100G building block
LR4	4λ, 1 Fiber, TEC	8W	High	No	25G NRZ x 4λ
PAM4	1λ , 1 Fiber	3W	Low	Yes	56G PAM4 x 1λ
DMT	1λ, 1 Fiber	5W	Mid	Yes	64G DMT x 1λ
PSM4	1λ, 4 Fiber	3W	Low	No	25G NRZ x 4 Fibers
CWDM	4λ, 1 Fiber	4W	High	Yes	25G NRZ x 4λ
LR2	2λ, 1 Fiber	5W	High	Yes	56G NRZ x 2λ

- 56G PAM4 provides lowest cost 100G
- Scalable to 400G with WDM or parallel fibers