

AI時代を支える多心光コネクタの進化

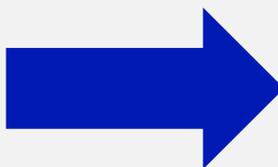
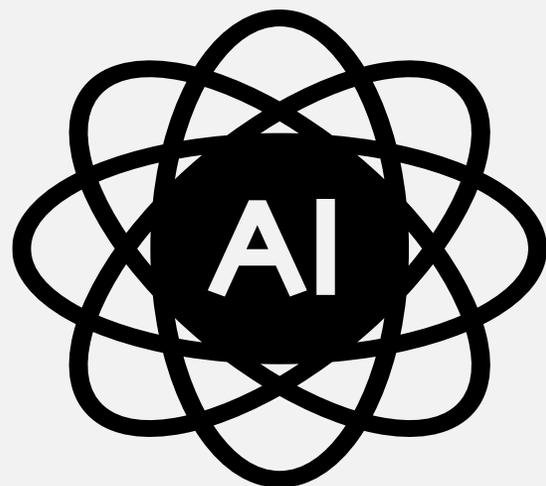
- OCPJ 2024 プレゼンテーション 2024.08.21 -

株式会社白山
金原

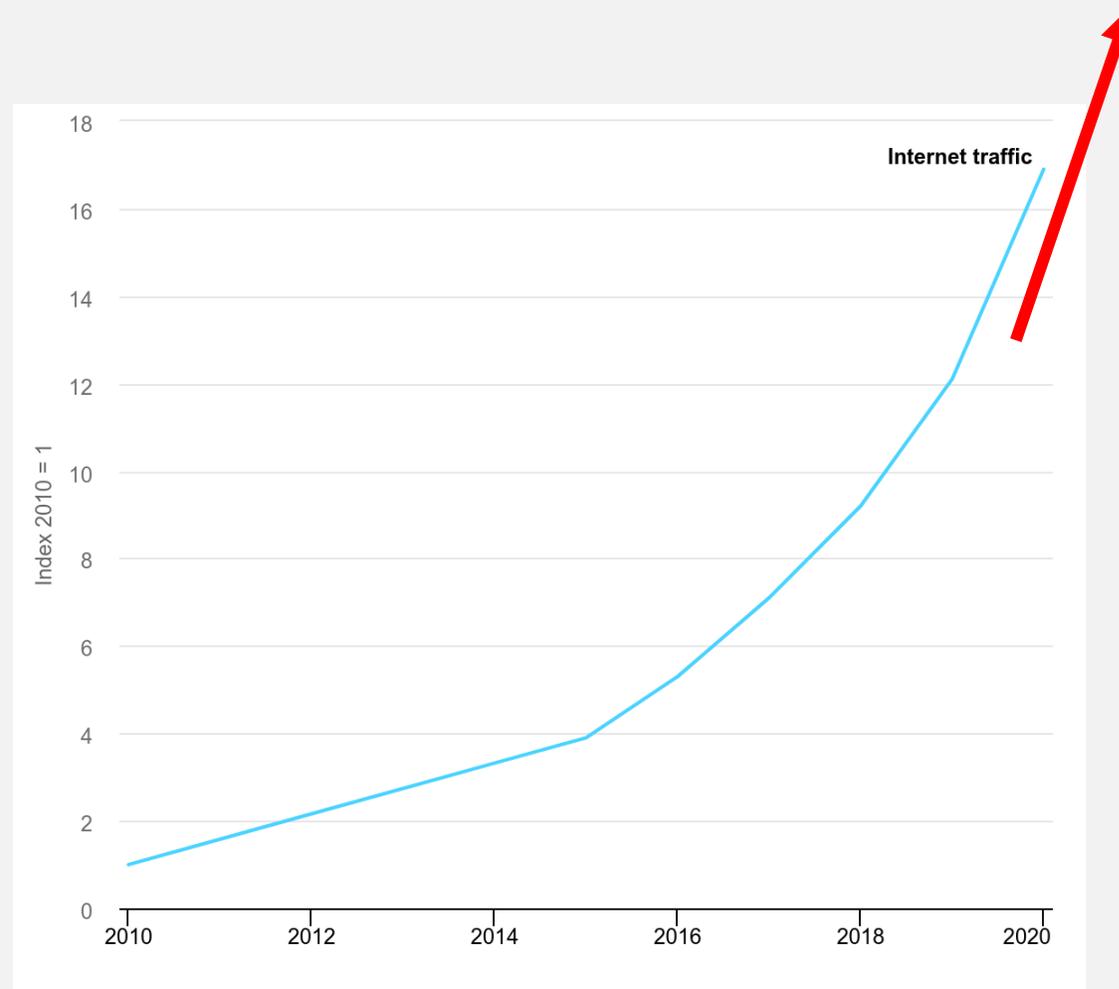
Contributing to the Fiber Optics market with 30+ Years Expertise in Multi-fiber Optical Connection



AIの登場と通信量の増大

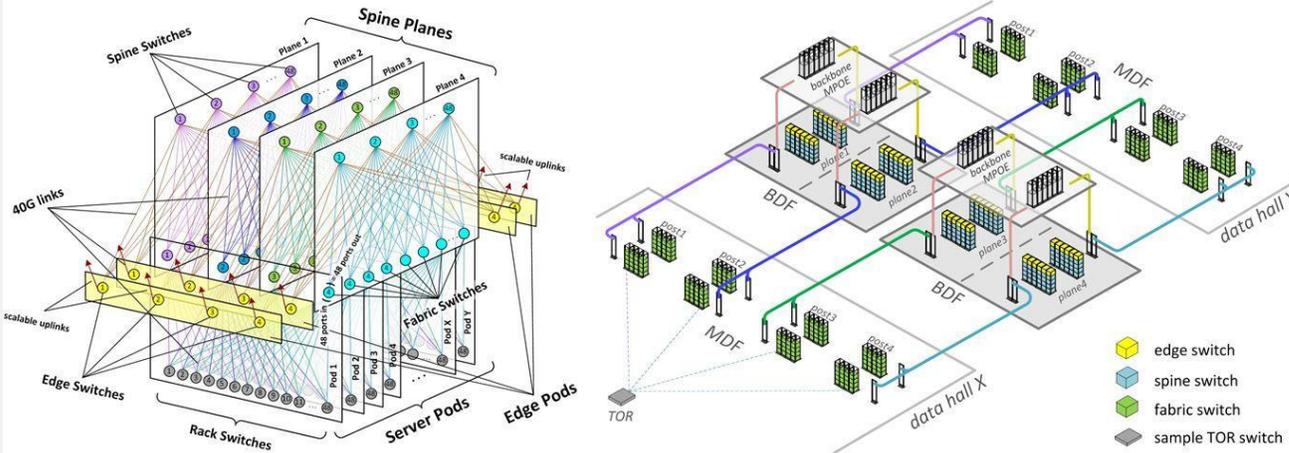


AIモデルの学習や推論には膨大なデータ処理
→データトラフィック量の更なる増加懸念



Global trends in internet traffic, data centres workloads and data centre energy use, 2010-2020

多心光コネクタの需要拡大



Source: [Engineering at Meta](#)

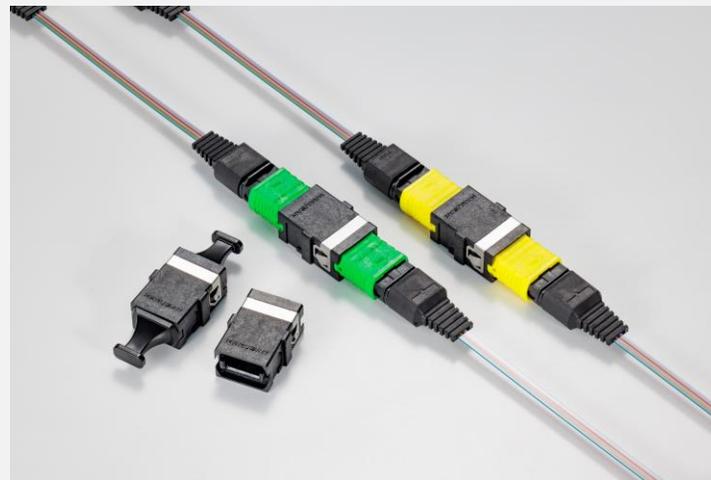
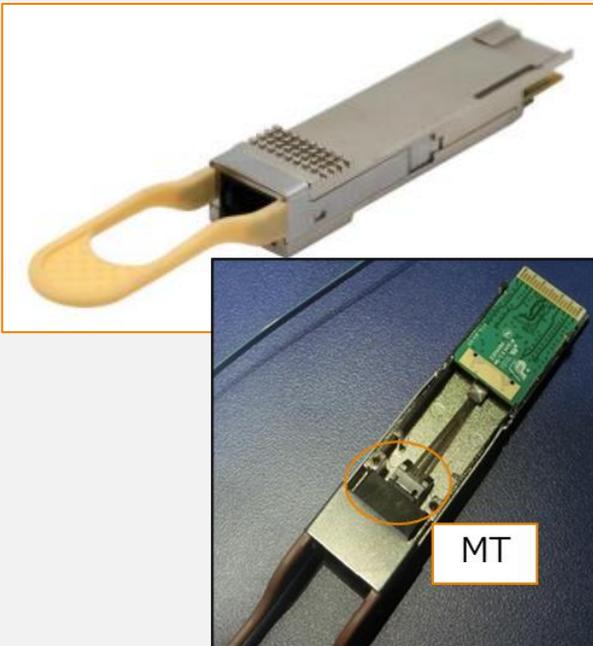
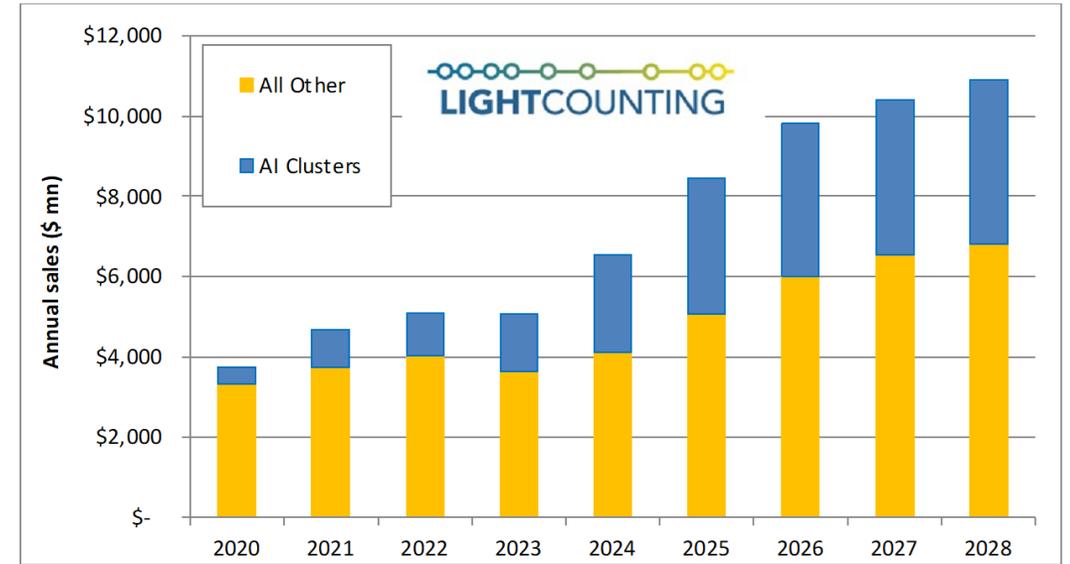


Figure: Sales of Ethernet Optical Transceivers by Application



Source: Lightcounting

更なる処理要求による問題



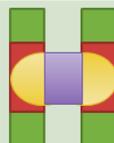
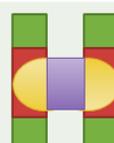
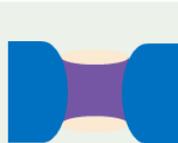
データセンターの電力・冷却問題

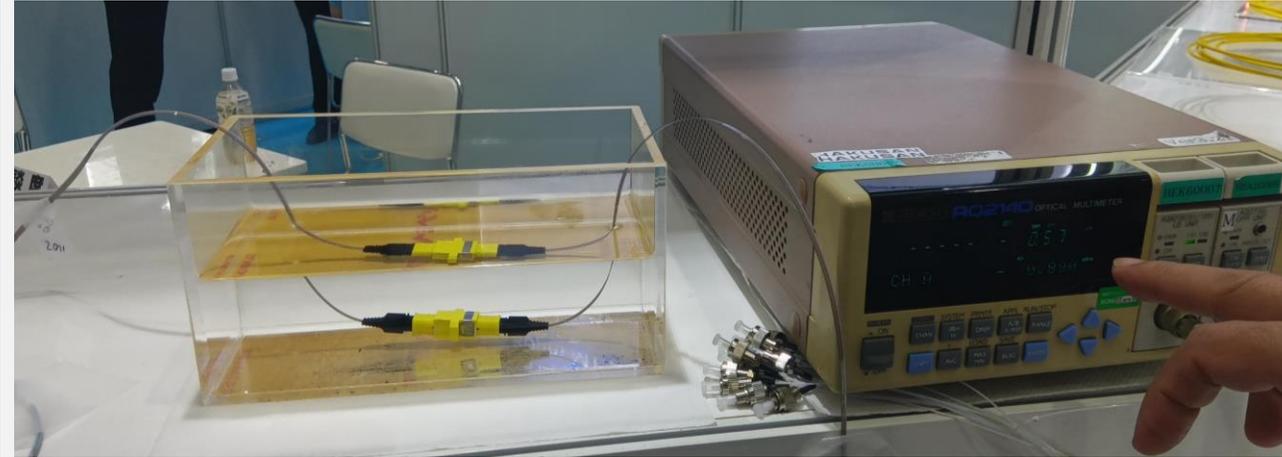
- 空冷
- 液冷
- 液浸冷却, etc...

Source: NVIDIA

開発背景と動機

- 1) GrinEBとMPOのインターフェース（先端の面積）が同じ。そのため、MPOとの接続も可能。（接続互換性）
- 2) **ビームが拡大されるため、ILに対する端面の汚れの影響が少ない。**
- 3) 空中、液浸冷却液下の環境でも使える接続構造
- 4) 低いばね力でも接続可能 (<5N)。-> 耐久性向上

	GRIN lens	PC connection	Spherical lens
Cleaning	○  Easy	○  Easy	△  difficult
Connection within liquid	○ Good 	△ difficult Need seal 	×  Can't connect
Connection in air	○ Good 	○ Good Physical contact 	○ Good 
Insertion loss	△ sensitive 	○ Good 	△ sensitive 



- ✓ Non-Physical Contact
- ✓ Less Spring force and longer Lifetime
- ✓ Available for Immersed environment
- ✓ Single-mode / Multimode application
- Initial Target: Single-mode Application

*開発中製品となります。
(Under-Development)

Board-Level Optical Interconnect Performance in Immersion-Cooled Environments - Objective

Motivation:

- Immersion cooling is gaining strong traction as a means of disruptive thermal management in HPCs and data centres.
- On-board optics is gaining importance through co-packaged optics and mid-board optics applications.
- There is insufficient understanding of how optical interconnect components will perform in immersion-cooled environments.



Source: intel

Objective:

- To investigate and evaluate different on-board optical components and interconnect solutions in different immersion-cooled environments including single-phase and dual phase.
- To understand how design factors of interconnect components affect the performance in the immersion environment.



Source: Microsoft

ご清聴ありがとうございました。



Connect to the Future Society

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