

# SENKO®

## Advanced Components

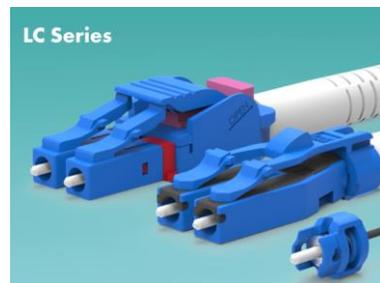
エコロジーとエコノミーの両立  
～光コネクタから始まる持続可能で拡張性のあるネットワーク構築～

OCPJ Meet-up 2024夏  
ライトニングトーク

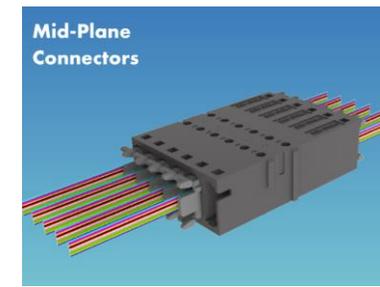
# 製品群



Legacy



Evolution



Revolution

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**SENKO**<sup>®</sup>  
Advanced Components

# 数字で見るSENKO

2位

コネクタ  
販売量  
世界シェア

9億

グローバル全体  
光コネクタ  
累計販売数量

1.1億

グローバル全体  
光コネクタ  
2021年販売数量

590+

次世代  
光コネクタ  
特許数

**SENKO**<sup>®</sup>  
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# 環境問題への取り組み

Faster, Leaner, Denser, **Greener** Data Center Design

# 低消費電力への取り組み

## Liquid Cooling

### Optical interconnect in immersion coolant

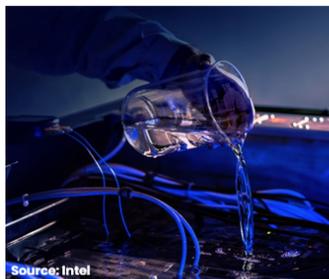
#### iNEMI multi-industrial partner fast-turn around project starting in October 2023

##### 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.

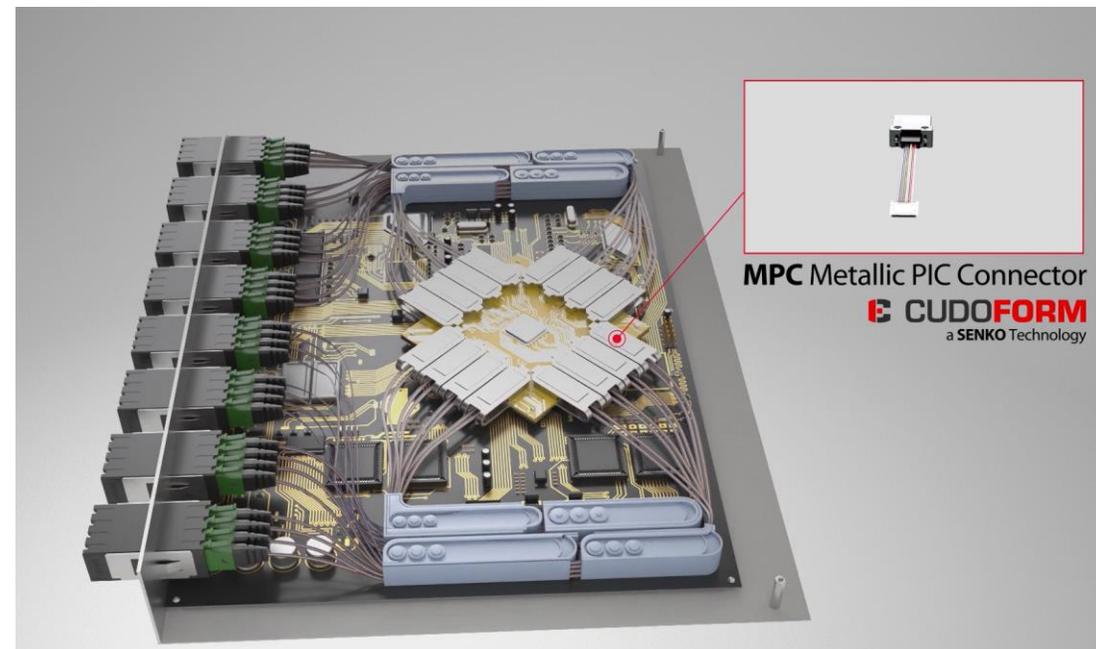
##### Objective:

- 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

## 光電融合



# 国連気候変動枠組条約第28回締約国会議



Green Digital Action  
at COP28



コネクタメーカーとして唯一参加

Source: ITU Green Digital Action Website

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# ITU-T CxO Meeting in Dubai

**Digital sector emissions need to be cut by **45%** from 2020 to 2030 to limit global warming to 1.5°C**



Participate in our efforts to:

- Reduce ICT Sector Emissions
- Foster a circular ICT industry
- Advance climate solutions through open environmental data and technologies
- Build momentum to implement green standards
- Facilitate a green transition across all industries through digital technology and skills development
- Leverage digital systems to ensure life-saving disaster alerts, in line with the UN Secretary-General's Early Warnings for All Initiative



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# 次世代コネクタによるネットワーク内 CO2排出削減

# 次世代世界標準 超小型光コネクタ(VSFF)

## SN<sup>®</sup>



規格採用済み

QSFP-DD

SFP-DD

OSFP



## SN<sup>®</sup>-MT



規格採用済み

OSFP

## CS<sup>®</sup>



規格採用済み

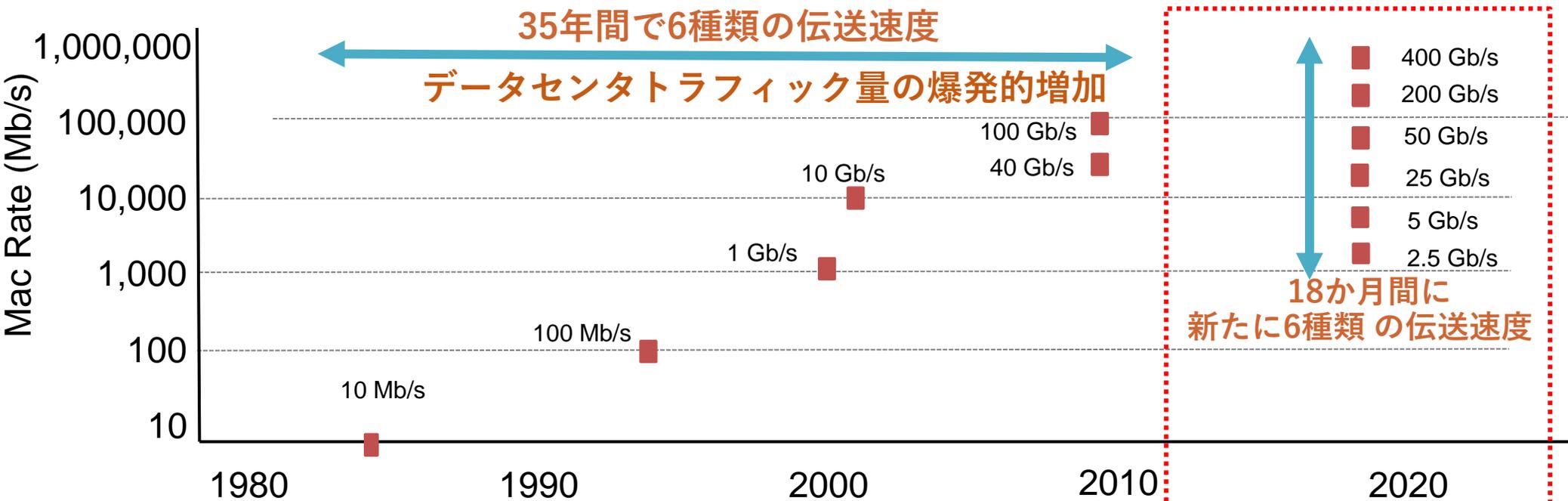
QSFP-DD

OSFP

TIA  
Telecommunications Industry Association



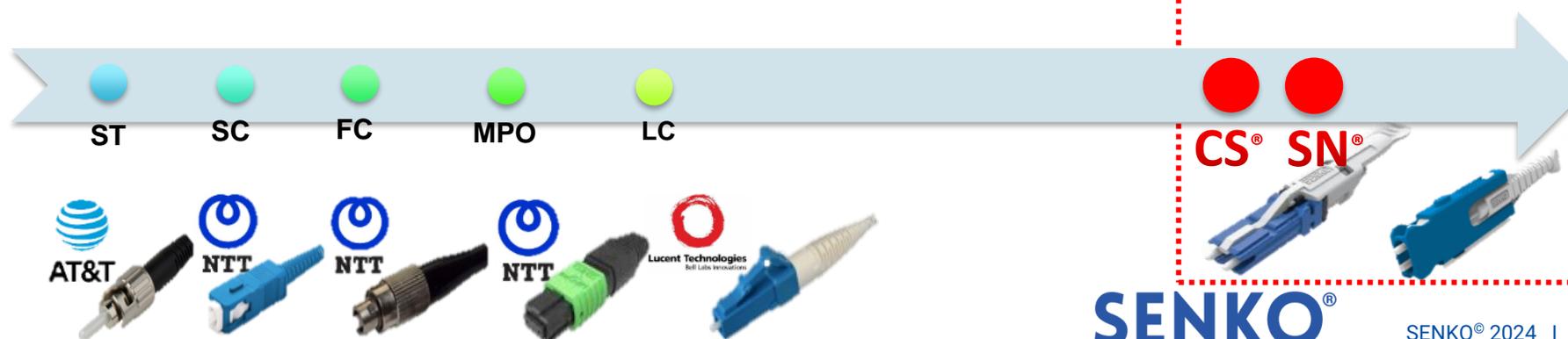
# 開発背景



**CS<sup>®</sup> Connector**  
adopted by



**SN<sup>®</sup> Connector**  
adopted by



# スイッチ1ポートあたりの消費電力削減



SN® 400G トランシーバ



CS® 200G トランシーバ

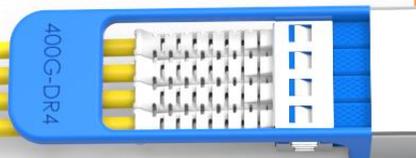
18W



400G(4x100G) = 18W  
\*100G=4.5W

VS

8W



SN® 400G = 8W

約56%削減

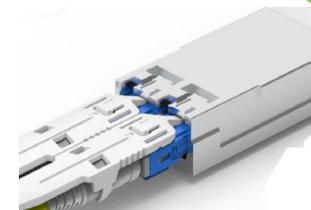
9W



200G(2x100G) = 9W  
\*100G=4.5W

VS

7W

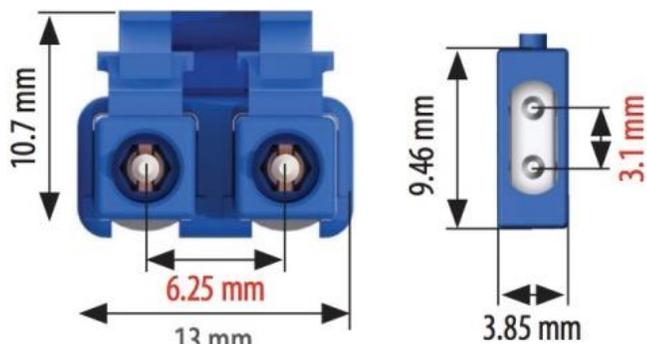


CS® 200G = 7W

約20%削減

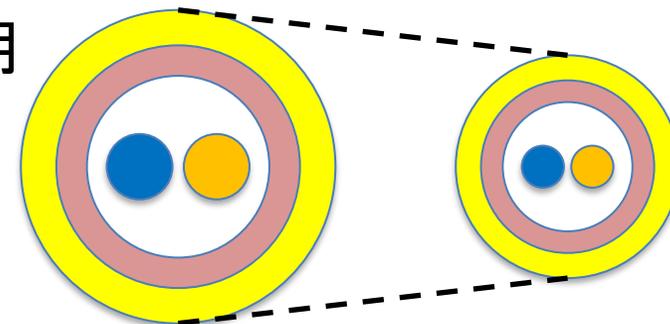
# コネクタ小型化によるメリット

①プラスチック使用量を削減



67%

②細径ケーブルの使用



③同一面積当たりのファイバ収容数向上

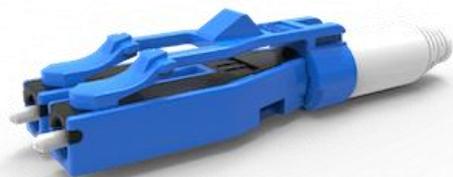
LCの場合: 最大144芯



VSFFの場合: 最大432芯



# コネクタ1個あたりのプラスチック使用量



Weight of plastic components:

**2.8g**



Weight of plastic components:

**0.8g**



Weight of plastic components:

**3.2g**



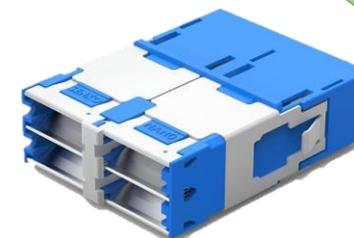
Weight of plastic components:

**1.8g**



Weight of plastic components:

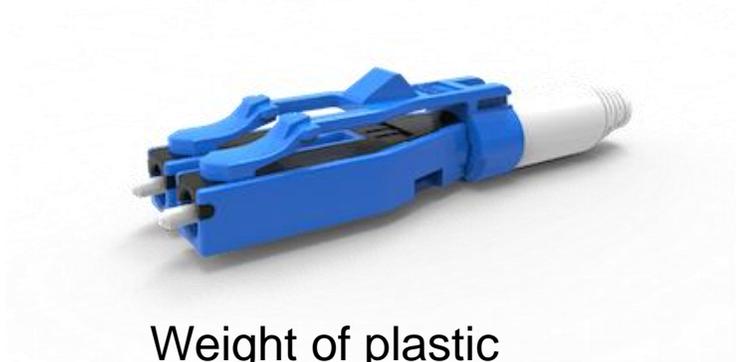
**4.5g**



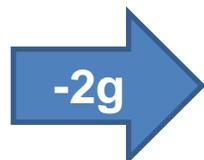
Weight of plastic components:

**3.8g**

# プラスチック使用量の削減



Weight of plastic components: **2.8g**



Weight of plastic components: **0.8g**



1g

=



4.5g

全世界で販売されたコネクタの数

=**503,000,000** 個 (2021年)

仮に2g/個CO<sub>2</sub>を削減したら…

原材料分のみだけで **1,006 トン**のCO<sub>2</sub>を削減

# パッチパネルの高密度化

## HYPER Density

As much as 432 fibers per 1RU of rack space. Huge cost-per-port savings and significantly better rack utilization.



**56 x SN<sup>®</sup>**  
 Total Capacity  
**216 CH**  
**432 F**  
(1RU single sided rack/cabinet)

## MEGA Density

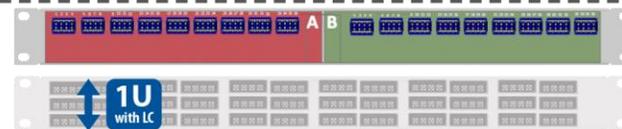
More than double the density of the current offering with LC connectivity. Significantly lower total cost per port.



**36 x SN<sup>®</sup>**  
 Total Capacity  
**144 CH**  
**288 F**  
(1RU single sided rack/cabinet)

## ULTRA Density

Industry bench-mark density per 1RU using engineered chassis and cassette systems.

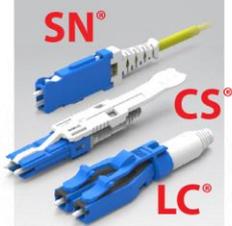


**18 x SN<sup>®</sup>**  
 Total Capacity  
**72 CH**  
**144 F**  
(1RU single sided rack/cabinet)

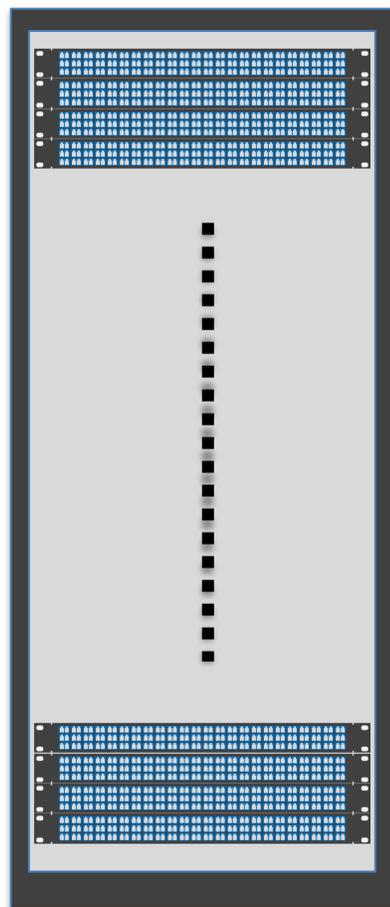
## MEGA <360 fibers



## ULTRA <144 fibers



# ラック単位でのCO2削減



通常48RU = 60kgs  
48RU をフル実装した場合= 300kgs

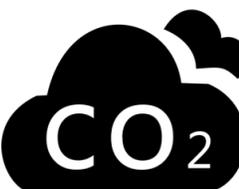
製造工程でのCO<sub>2</sub>:

- Laser cutting
- Metal bending
- Powder coating

## 48RU LCコネクタ

1RUあたり144芯

- 6,912 芯
- コネクタ100個当たりCO<sub>2</sub> 排出量: 8.4kg

420kg 

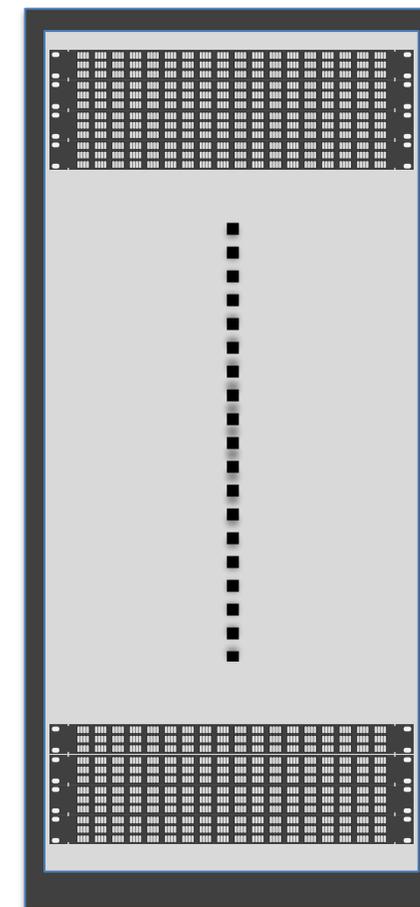
電力消費= 224kW

156.8kg 

## 48RU VSFF コネクタ

1RUあたり432芯

- 20,736 芯
- コネクタ100個当たりCO<sub>2</sub> 排出量: 2.8kg



# 将来への拡張性

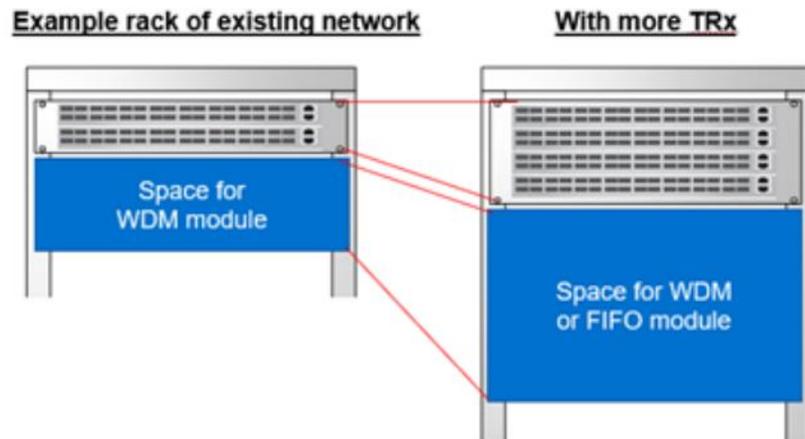


Figure B.3-6: Illustration of Rack Space Required for TRx Ports and WDM/FIFO Module Using Existing Components

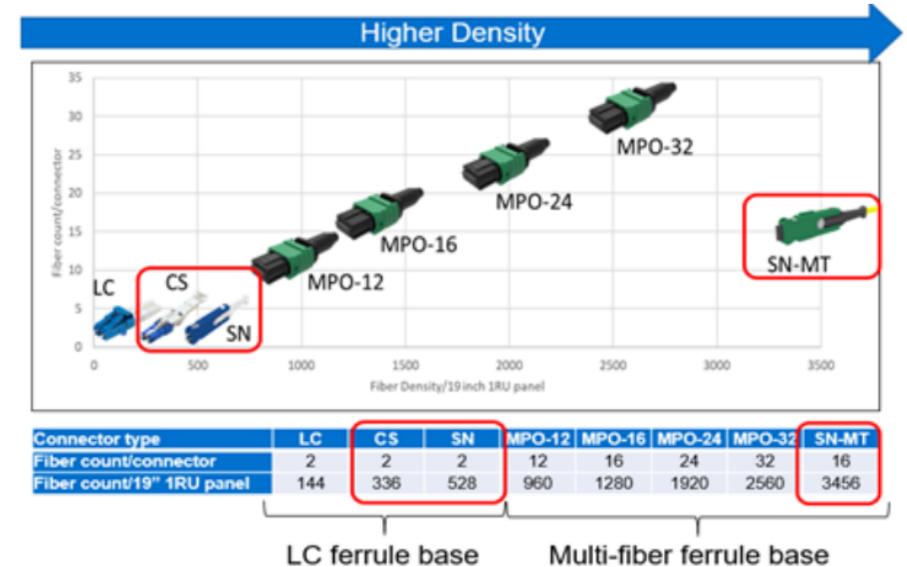


Figure B.3-7: Graph of Fiber Optic Connector Density Comparisons among LC, CS, SN, MPO, and SN-MT Connectors

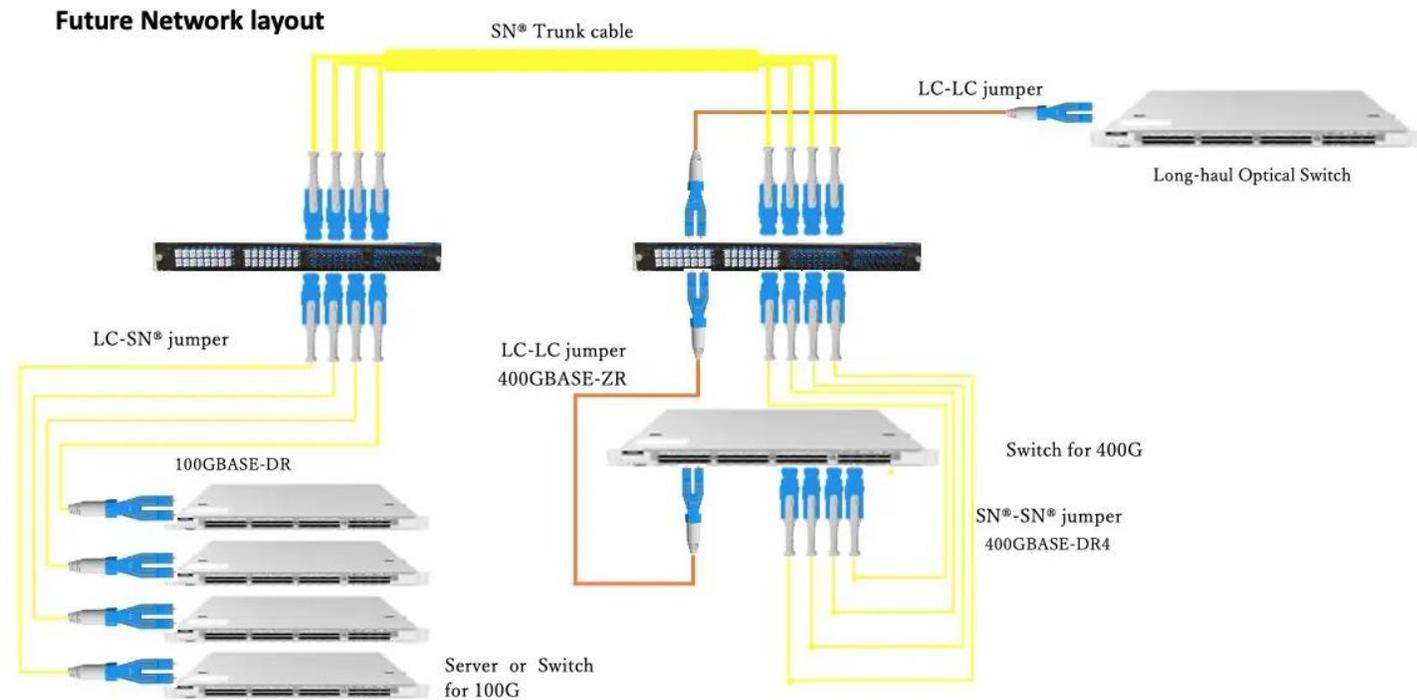
All Photonics Network 構想では光のEnd-to-Endでの接続が増え、より多くのトランシーバーやファイバーの収容が問題に



1つの解決策:  
VSFF(Very Small Form Factor)  
コネクタを使い、省スペースでの収容

# 国内データセンター事業者様との取組み

## BBTower様とSN®コネクタを用いた光通信機器の活用について検証



ブロードバンドタワー様検証内容



It all starts by making the right choices...



It is never wrong to do the right thing....

# お問い合わせ先:



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オプティカルコミュニケーションズ事業本部

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# SENKO<sup>®</sup>

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