



Ribbon High Density Optical DCI



Accelerating Network
Transformation

High Density Low Power Consumption Data Center Interconnect

Ribbon delivers the industry's highest density and lowest power consumption optical transport DCI, featuring up to 25.6T capacity in a 2RU platform at less than 0.07W/G.

This can be supplemented with a flexible optical line system to fulfill any amplification and ROADM needs. Management options range from platform APIs to a sophisticated DCI controller with operator-definable automation.



What Ribbon Offers

Superior Technology

- Highest density 25.6T in 2RU
- Lowest power 0.07W/G
- 400ZR+ upgradable to 800ZR+ on the same blade
- Wavelengths to 1.2T

Easy to Operate

- Network equipment APIs
- Sophisticated lightweight DCI controller with do-it-yourself automation

Easy to Work With

- Tailored configurations
- White glove installation
- Tiered field support

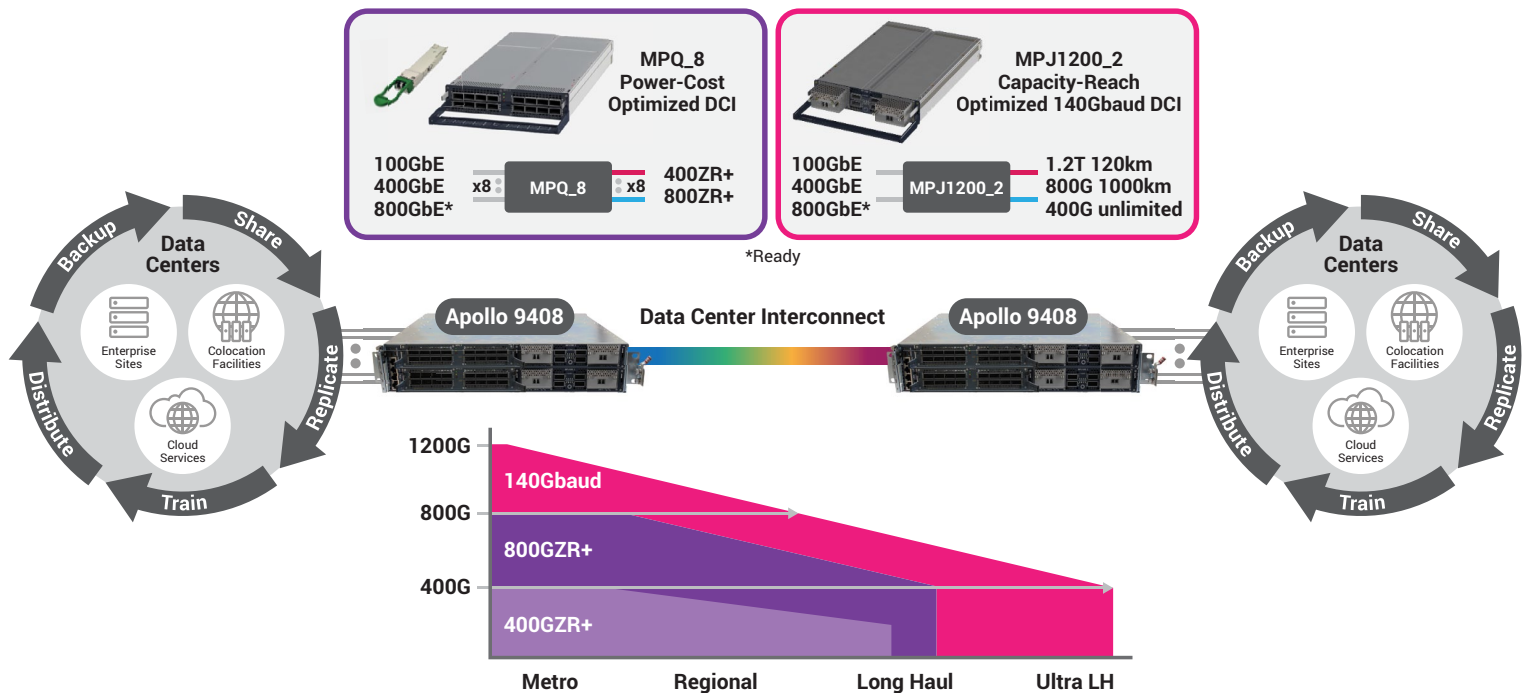
Apollo 9408 Compact Modular Optical Transport Platform

The solution is based on the Apollo 9408 2RU compact modular data center platform, designed for high density and lower power consumption transport of 100GbE, 400GbE, and future 800GbE clients.

The 9408 is easy to operate and can be deployed as an overlay to existing networks with control via OpenConfig or OpenROADM APIs supporting auto discovery and gNMI telemetry. Connectivity is simple with MPO fibers, and all modules are field replaceable including muxponder sleds, shelf controller, power supply, and fan trays.

The 9408 offers two DCI transponder-muxponder sleds, MPQ_8 for **power-cost optimized DCI** and MPJ1200_2 for **capacity-reach optimized DCI**, which can be used with any mix in the platform. Both sleds use pluggables for all client and line interfaces, enabling economic pay-as-you-go growth.

Ribbon High Density Optical DCI



MPQ_8 Power-Cost Optimized DCI

MPQ_8 uses industry-standard QSFP-DD DCO 0dBm pluggable transceivers for power-cost optimized DCI applications spanning metro and regional distances. Its ultra-dense design supports eight (8) independent client-line transponder-muxponder pairs.

Notable capabilities of the MPQ_8 are:

- Support for multiple QSFP-DD DCO line types including ZR+ with interoperable PCS, and OTN.
- A **unique ability** to upgrade 400ZR+ transceivers to 800ZR+.
- An industry highest line density of 6.4T per sled or 25.6T per 2RU 9408 platform.
- An industry lowest power consumption of less than 0.07W/G.
- An ability for client interfaces to support coherent interfaces for line rate regeneration.
- Pluggable optical line protection.
- Pluggable EDFAs for a mini optical line system.

A variant of the MPQ_8 called the FPQ_2 that supports 100GbE LR4 and 100ZR clients is also available.

MPJ1200_2 Capacity-Reach Optimized 140Gbaud DCI

MPJ1200_2 sled uses high-performance 5nm-140Gbaud transceiver technology to meet the most demanding optical transport applications. Two independent client-line transponder-muxponder pairs deliver 1.2T wavelengths for short haul DCI links, 800G for regional coverage, and 400G for unlimited long haul. Continuous baud rate and continuous modulation controls maximize the line rate for any distance and channel condition right to the edge of the Shannon Limit.

The transceivers are pluggable for smooth growth.

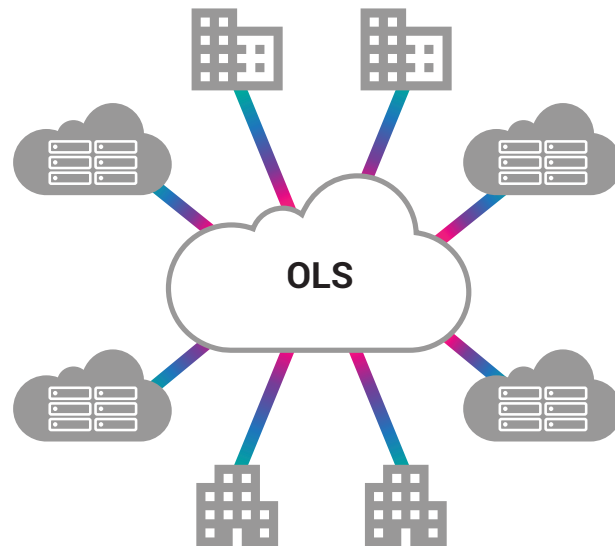
Ribbon High Density Optical DCI

Apollo Flexible Optical Line System

While most DCI applications are less than 100km/60miles and point-to-point, many require in-line amplification for extended distances and ROADMs for networking multiple data center connections.

Apollo's OLS covers all needs using:

- A large menu of Erbium Doped Fiber Amplifiers (EDFAs), Raman, and Hybrid EDFA/Raman amplifiers.
- A range of 4-degree to 20-degree flex grid ROADMs, supporting a full set of colorless, directionless, and contentionless add/drop options. Associated Wavelength Switched Optical Networking software delivers automated restoration.



Muse DCI Network Controller

Muse cloud-native SDN orchestrator delivers real-time control over Ribbon IP and Optical networks. While DCI operators can manage Apollo NEs directly using APIs, Muse supports a fully featured lightweight version tailored for Apollo DCI solutions, enabling operators to maximize the value of their investment.

Through powerful Web UI interfaces Muse speeds up service creation and provisioning, assures that services meet commitments, and reconfigures the network on failures. Powerful analytics monitor optical performance and fiber health and use trend analysis to identify potential problems before they affect services. Muse low-code toolkits enable operators to add workflow automation, ecosystem integration, and other customizations without expensive professional services support.

Network Automation

Workflow Engine **Closed Loop Automation**

Multi-Vendor and OSS Integration

Flexible NBI **Flexible SBI**

Advanced Analytics

Network Insights **Network Health**

Cloud Native Architecture

Microservices Architecture **K8S Infrastructure**

Ribbon High Density Optical DCI

Key Specifications

Apollo 9408 compact modular platform	<ul style="list-style-type: none">• 8 single slots, 4 double slots• 2RU 600 x 440 x 88.4 mm• Front-to-back airflow• 0°C - 45°C• All sleds and common modules field replaceable• 6 controller ports (1 console, 4 RJ45, 1 USB-C)
MPQ_8 power-cost optimized sled	<ul style="list-style-type: none">• Double slot• Eight independent lines using QSFP-DD-DCO 0dBm+ pluggable transceivers delivering 100G to 800G per line• OpenZR+ and OpenROADM compliant• 8 x QSFP-DD clients each supporting 1x400GbE or 4x100GbE; gray or ZR+
FPQ_2 power-cost optimized LR4 sled	<ul style="list-style-type: none">• Double slot• Two independent lines using QSFP-DD-DCO 0dBm+ pluggable transceivers delivering 100G to 800G per line• OpenZR+ and OpenROADM compliant• 6xQSFP28 and 2xQSFP-DD clients supporting 100GbE LR4 and 100ZR• Built-in Y-protection or OLP protection
MPJ1200_2 capacity-reach optimized sled	<ul style="list-style-type: none">• Double slot• Two independently pluggable 5nm-140Gbaud transceivers delivering line rates from 400G to 1200G using continuous baud rate and modulation• Two QSFP-DD clients each supporting 1x400GbE or 4x100GbE; gray or ZR+• Single QSFP-DD800 each supporting 2x400GbE or 8x100GbE; gray or ZR+
Encryption	<ul style="list-style-type: none">• Optional AES-256 L1 optical encryption with both conventional and PQC/QKD key exchange
Optical Line System	<ul style="list-style-type: none">• Full range of EDFA and Raman amplifiers• 4 to 20 degree flex grid ROADMs supporting a full set of colorless, directionless, and contentionless add/drop options
Management	<ul style="list-style-type: none">• Muse SDN Orchestrator• OpenConfig and OpenROADM APIs• gNMI telemetry

Contact Us Contact Ribbon to learn how we can fulfill your High-Density DCI Needs

About Ribbon

Ribbon Communications (Nasdaq: RBBN) delivers communications software, IP and optical networking solutions to service providers, enterprises and critical infrastructure sectors globally. We engage deeply with our customers, helping them modernize their networks for improved competitive positioning and business outcomes in today's smart, always-on and data-hungry world. Our innovative, end-to-end solutions portfolio delivers unparalleled scale, performance, and agility, including core to edge software-centric solutions, cloud-native offers, leading-edge security and analytics tools, along with IP and optical networking solutions for 5G. We maintain a keen focus on our commitments to Environmental, Social and Governance (ESG) matters, offering an annual Sustainability Report to our stakeholders. To learn more about Ribbon visit [ribbon.com](https://www.ribbon.com).