



Cisco Systems, Inc.

- 400ZR
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Cisco believes in open networking and has made significant contributions to multiple Optical Internetworking Forum (OIF) implementation agreement efforts. Cisco is participating in the following OIF demonstrations at OFC 2022.

400ZR



The 400Gbps 400ZR Quad Small Form-factor Pluggable Double Density (QSFP-DD) coherent optical module supports high-capacity router configurations, and adheres to the OIF 400ZR Implementation Agreement to optimize 400Gbps data center interconnect (DCI) edge links up to 120km using 16QAM transmission. These modules incorporate Acacia's 3D Siliconization, which leverages the maturity of Acacia's silicon photonics to achieve a high level of component integration, enabling network operators to address increasing bandwidth demand through a simplified network architecture. The 400ZR QSFP-DD is based on 7nm DSP technology, our 3rd generation of coherent DSPs supporting low-power pluggable modules, and our silicon photonic integrated circuit (PIC) for an optimized co-packaged design.



CFP2 coherent optical modules address a wide range of network optical interconnect applications including service provider access aggregation, wireless 5G backhaul, metro and long-haul networks, as well as data center interconnects. The 400G CFP2 coherent optical module features an expansive list of interoperability modes including OIF 400ZR and leverages Acacia's 3D Siliconization technology for scalability and reliability. Pluggable solutions such as 400G CFP2 are designed to enable network operators to address increasing bandwidth demand through a pay-as-you-grow model, which can reduce both capital and operational expenditures.

400G digital coherent modules play an integral part in optical networking designs leveraging OIF 400ZR when plugged into the Cisco platforms such as the Cisco® 8000 Series routers as well as the Cisco Network Convergence System 1001 (NCS 1001) DWDM line system.

Cisco 8200 Router



At the OFC 2022 OIF 400ZR demo, 400G coherent optical modules are plugged into the Cisco 8201-32FH router and connect into a Cisco NCS 1001 DWDM line system with MD-64-C Mux/Demux for add/drop.

Cisco NCS 1001 DWDM Line System



The 8200 Series is a fixed chassis router that utilizes Cisco's Router-on-Chip (RoC) architecture to deliver full routing functionality with a single ASIC per router. The Cisco 8200 provides up to 12.8 Tbps of network bandwidth with lower power than similar systems. The NCS 1001 is a 1RU line system that is mechanically optimized for data center environments; is performance optimized for maximum capacity; and provides complete

automation of installation and configuration with real-time and fine-grained monitoring. It supports up to three pluggable modules. The modules can be amplifiers, protection switch or OTDR modules. An unprotected point-to-point or a protected point-to-DWDM line system can be implemented with one NCS 1001 shelf.

Cisco NCS 1001 Mux/Demux Patch Panel

The Mux/Demux 64-Channel Patch Panel is a standalone passive unit that contains both a 64-channel optical multiplexer and demultiplexer, pre-cabled within the unit's housing. This filter is designed with optimum tradeoff between bandwidth and isolation for a network designed with 64 channels of 400ZR.



CMIS

CMIS is becoming the management interface of choice for next generation pluggable modules, capable of managing both simple and advanced modules. CMIS provides a well-defined mechanism to initialize and manage optical and copper modules in a standard way, while still providing the capability to provide custom functionality. This commonality makes integration into different host platforms easier for both the host vendor and the module vendor.

The CMIS demo consists of four separate demonstrations that show how modules can be managed and initialized, how modules can support multiple independent services (breakout) and how module firmware can be easily upgraded.

Co-Packaging

Cisco is also participating in the OIF Co-Packaging demonstration leading the industry by collaborating with other OIF members in standardizing the interface between the ASIC and a 3.2T socket which can house optical modules or co-packaged copper modules. This will bring efficiency to the system, decreasing power consumption and thereby reducing the total life-cycle cost of our systems while reducing the carbon footprint of the data center. To support this transition a pluggable external light source called the ELSFP is also being standardized in the OIF. This enables lasers to be packaged in a field replicable pluggable module at the cool face plate of the system. This form factor is a multi-generational form factor with flexibility to adapt to links using 100G/lambda, 200G/lambda and beyond. To demonstrate the feasibility of the blind-mate electro-optical connector in the ELSFP and the lasers which meet the power specification for CPO modules, the OIF community has come together with Cisco in some first active demonstrations of the ELSFP and its sub components and a full scale mechanical mock-up of a Co-Packaged system.

Cisco is proud to apply our domain expertise and industry acumen, working with OIF to accelerate optical networking innovations. For more info on coherent modules, visit www.acacia-inc.com. Cisco, the worldwide leader in technology that powers the Internet, is committed to powering an inclusive future. Our leadership with OIF demonstrates our commitment to change the way networks are deployed. For more info on Cisco's solutions highlighted in the OIF 2022 demo, visit www.cisco.com.

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