



Why Should I Care About Cisco CWDM?

CWDM, which stands for coarse wavelength-division multiplexing, is an optical technology for transmitting eight channels, each in a separate wavelength or color, over the same fiber strand. Unlike dense WDM (DWDM), which can transmit 32 or more channels on the same fiber by tightly packing them, CWDM technology relies on a looser or wider spacing between channels. This design makes CWDM a relatively inexpensive technology for transmitting multiple Gbps on a single fiber strand, as compared with DWDM. The multiplexing effect is achieved through special passive (nonpowered) glass devices known as filters. The filters act as prisms, routing lights from many incoming/outgoing fibers (client ports) to a common transmit/receive trunk port.

What Problems Need to Be Solved?

CWDM is ideally suited for both enterprise and service provider metropolitan-area networks that need to scale bandwidth and breadth while taking advantage of the investment in fiber infrastructure.

The flexibility of Cisco® CWDM filters makes it possible to build various topologies, from point-to-point to bus or ring configurations. The bandwidth can be scaled in a pay-as-you-grow fashion, with new channels being added as needed. Moreover, with the Cisco CWDM solution, the user has the choice of using CWDM gigabit interface converter (GBIC) optics and Small Form-Factor Pluggable (SFP) optics directly in switches and router ports. Third-party devices can participate in the CWDM cloud through Cisco SFP-based wavelength converter devices that support any protocol and data rate from 155 Mbps up to 2.488 Gbps.

The Cisco CWDM Solution

The Cisco CWDM solution consists of three types of components:

- **Cisco CWDM GBIC and SFP transceivers:** The Cisco CWDM GBIC transceiver operates at the Gigabit Ethernet data rate, while the Cisco CWDM SFP transceiver operates at any rate from 622 Mbps (OC-12/STM-4) to 2.488 Gbps (OC-48/STM-16 supporting Ethernet, Fibre Channel/FICON, and SONET/SDH applications).
- **Cisco WDM passive devices (Figure 1):** These include an 8-wavelength filter, two 4-wavelength and eight single-wavelength dual-channel (east-west for ring application) filters. In addition, the Cisco CWDM solution includes a special filter to mix CWDM and older 1300-nm signals on the same fiber.

Figure 1. Cisco CWDM Solution with SFPs and Passive Filters



- **A dual-channel SFP transponder (Figure 2):** This transponder can take any signal (in the client SFP ports) from 155 Mbps to 2.488 Gbps and use a Cisco CWDM SFP to convert it to a CWDM wavelength, thus allowing any non-CWDM-capable device to participate to the CWDM cloud.

Figure 2. Cisco CWDM SFP-Based Transponder



What Are the Benefits of the Cisco CWDM Solution?

The Cisco CWDM solution is based on pluggable optics that go directly into switches and routers, making it possible to manage CWDM optics just like any other interface.

The Cisco CWDM solution has a very flexible set of passive filters to support virtually any network topology. Because Cisco CWDM filters have the industry's lowest insertion loss, they allow ring network configurations with 8 channels to reach 50 km (30 miles) in circumference and point-to-point configurations to reach over 80 km (50 miles).



In addition, the Cisco CWDM solution uses the SFP transponder platform to allow third-party devices or devices that do not directly support CWDM pluggables to take advantage of CWDM capabilities. Thus, instead of being limited to Cisco Ethernet switches, the CWDM solution enables any third-party non-Ethernet platform to make use of CWDM technology. (See Figure 3.)

Figure 3. Cisco CWDM Transponder and CWDM Filter Components



For More Information

For more information, refer to <http://www.cisco.com/en/US/products/ps6575/index.html>.