

Cisco Open Network Environment: IP and Optical Convergence



What Is the Value of IP and Optical Convergence?

The Internet of Everything is introducing a new and diverse array of devices and other things that can access existing and new services. However, for service provider networks, it also adds greater complexity, surges in bandwidth, and increased session demand. Over-the-top (OTT) media services add to these problems. Separate, manual service-provisioning systems in the IP and optical network layers slow operator responses to customer service requests. One solution is to upgrade networks from 10 Gbps to 100 Gbps to increase speed and capacity. Operators must also scale networks to handle growth and prioritize services as required. But provisioning and resource utilization must also be optimized, so that requests can be completed in minutes, instead of weeks or months.

Service provider architectures are based largely on separate IP and optical network layers that are usually designed and operated independently. Convergence of IP and optical network layers for centralized visibility and programmability is an effective strategy for increasing service velocity, adapting more easily to dynamic cloud topologies, enhancing resiliency, and decreasing total cost of ownership (TCO).

IP and optical network convergence is a key capability of the Cisco® Open Network Environment (ONE), a framework of technologies that provide applications with real-time insight into what is happening across the data center and WAN infrastructure. Cisco nLight™ technology is a building block within the Cisco ONE framework. It enables providers to gain a single point of visibility and programmability across IP packet and optical dense wavelength-division multiplexing (DWDM) network layers.

What Problems Does It Help Solve?

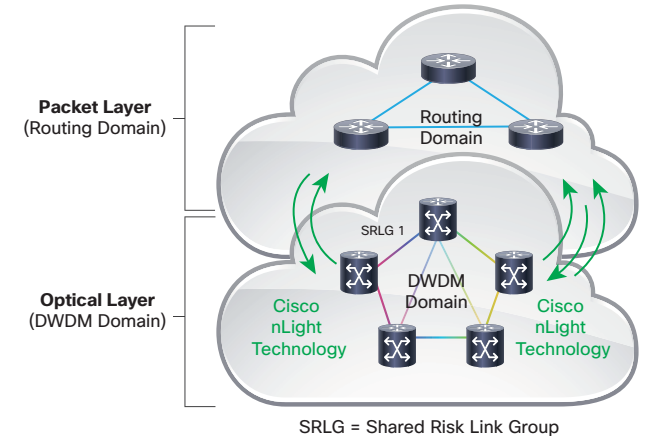
With growing demand for a wide variety of services across today's service provider networks, existing and new services can generate large surges in bandwidth usage. With separate legacy systems in IP and optical domains, optimizing end-to-end service delivery is a complex and time-consuming manual process. Additionally, because optical transport is critical, every link and optical component is replicated to achieve redundancy. The redundant fiber and optical equipment doubles a service provider's capital expenditures (CapEx) even though half of this infrastructure is unused, except in the event of a failure. The intelligence and programmability of Cisco ONE technologies are designed to expedite service delivery, accelerate customer provisioning, and utilize network resources more cost effectively.

The multilayer control plane provided by Cisco nLight technology shares information between IP and optical network layers. Using Cisco nLight technology, service providers can automate complex processes, significantly simplify and speed operations, and take advantage of features that reduce overall network costs by reducing the number of interfaces required on routers and the number of transponders required.

Cisco nLight Technology

Cisco nLight technology addresses the complexity, scalability, and operational inefficiency in service provider networks by providing a multilayer control plane that allows service providers to integrate previously independent IP and optical layers (Figure 1). Information, such as real-time network topology changes, capacity and provisioning data, and protection and restoration details, is shared across the IP and optical domains for increased service velocity and better adherence to service-level agreements (SLAs). Customer provisioning times can be reduced from weeks or months to minutes.

Figure 1. Cisco nLight Technology for IP and Optical Convergence



What Are the Benefits of IP and Optical Convergence with Cisco nLight Technology?

- Increased service velocity
- More agile adaptation to dynamic cloud topologies
- Enhanced resiliency
- Reduced network TCO through lower CapEx and operating expenses (OpEx)
- Increased longevity of DWDM infrastructures

Why Cisco?

Cisco ONE is a customizable software framework of use case-driven, modular technologies that service providers can use to harness the untapped value of their intelligent networks. Find out more about how Cisco ONE is creating a suite of capabilities to power the Internet of Everything and make your networks more agile.

For More Information

Additional information about Cisco ONE is available at:
<http://www.cisco.com/go/one>