Secure Optical Networking

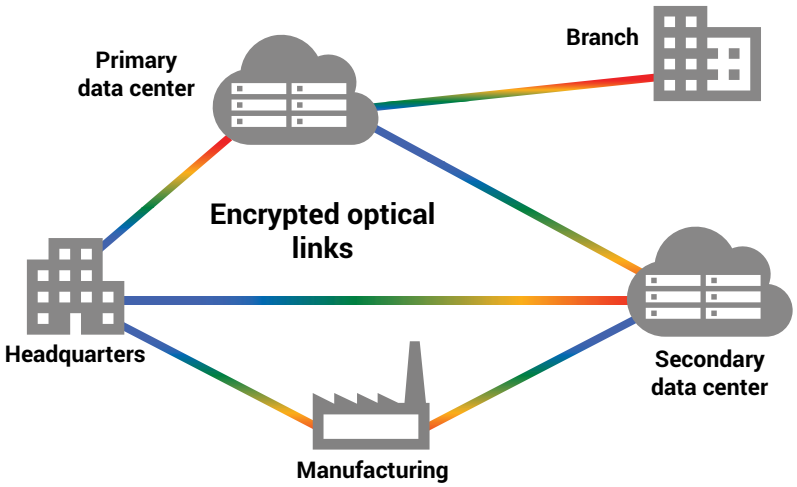
for Your Enterprise

High-Performance Optically-Encrypted Private Networks

Data is the lifeblood of your business. It must be accessible across your enterprise to power business applications and services to end-customers. Data must also be replicated across multiple locations for business continuity and disaster recovery contingency plans. It is essential that you protect this data from eavesdropping, theft, and corruption, as it flows along the connections between your corporate locations and data centers, which constitute the arteries of your business.

It is now easier and more economical than ever to attain the needed performance and security through optical networking, secured by optical encryption. This offers a competitive advantage to your enterprise, fulfilling business needs today, while providing a future-proof platform for expansion. Whether you start with a few point-to-point links, or engineer a full-mesh network with redundancy, ECI's Apollo optical networking system can be tailored to your enterprise connectivity needs.

Unbreakable encryption against interception	**Unlimited** ultra-low-latency bandwidth	**Economical** easy to configure and manage



- HQ ↔ Branches
- HQ/branches ↔ Data centers
- Data center ↔ Data center

Advantages of Optical Networking for Your Enterprise

Deploying optical links in your enterprise has numerous benefits, when compared with public network or leased-line solutions:

- **Complete control** – As a private network, you have total control over the infrastructure. There is no dependence on third parties.
- **Unlimited bandwidth** – Optical links can handle all current and future corporate communications needs easily. This enables consolidating all data, voice, and video networking services on a single network.
- **Fastest response time** – Optical links have the lowest latency of any network type. This is particularly important for productivity when applications, like data mirroring, online financial trading, or Office 365 are running at remote data centers.
- **High reliability** – Redundancy can be added, as needed, through multiple optical routes, or with backups, using public facilities.
- **Easy management** – Services and network facilities can be turned up and monitored from a centralized location.
- **Fast ROI** – Modern optical networks are highly economical. Our experience shows that enterprise optical networks typically pay back within 30 months, and sometimes in as little as 12 months, when compared with public or leased solutions.

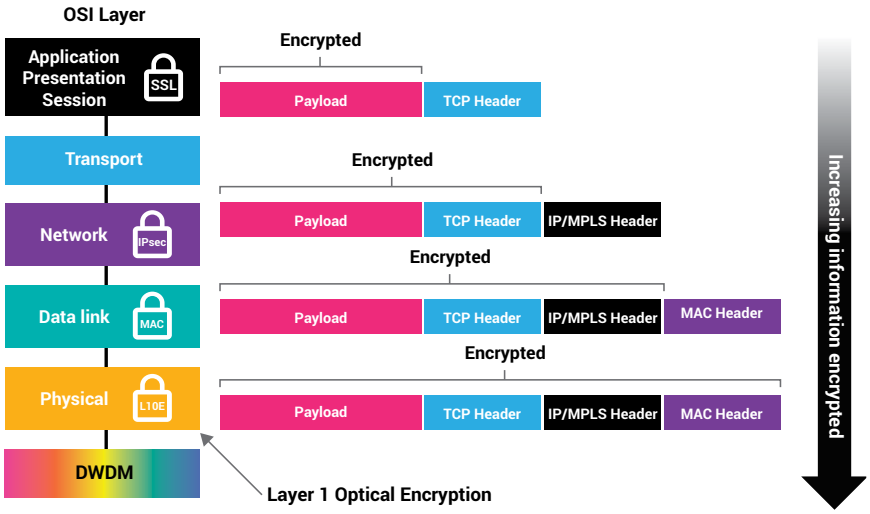
The good news is that it is now easier than ever to build an enterprise optical network. Dark fiber is readily available within and between metropolitan areas. There are also pre-wired buildings to connect branch locations that may occupy only a portion of a building, and numerous co-location data centers in which to implement private clouds. As a final ingredient, a new generation of slimmed-down and easy-to-manage optical networking gear eliminates the fear of building and running an optical network.

The Case for Adding Optical

So, you decided to use optical networking for your enterprise communications. Now you need to make one additional decision – Do you protect those links with optical encryption? There are several reasons why the answer should be yes!

Only optical encryption can protect the data flowing over optical fibers from snooping via fiber tapping. Even if you use encryption methods at higher layers, the addressing information is still exposed. This means that intercepted optical flows can reveal your network architecture and communications patterns, plus (of course) any data that is not protected by other encryption methods. Moreover, optical encryption has no performance penalty. It operates at wire speed, without adding any overhead or delay.

In the same way that you use multiple layers of security in your home or business, optical encryption should be the foundation for protecting your enterprise communications. It provides additional reassurance to your customers that you are keeping their information safe, and assists in complying with government regulations and industry standards.



Secure Optical Networking for Your Enterprise

Ribbon has proven capability to implement optical networking for private networks, with many deployments, worldwide. Our success is based on the Apollo optical networking system, which brings performance developed for large public networks, and scales it down to fit the needs and budgets at an enterprise level. Apollo uniquely combines comprehensive efficient optical networking with flexible unbreakable optical encryption, to make it an easy choice for implementing secure optical networking across your enterprise.

Comprehensive efficient optical networking

Handles all corporate communications - Apollo lets you carry all enterprise communications over optical links by supporting the richest set of service interfaces for data, storage networking (SAN), voice, and video. These include:

- Ethernet – from 1GE to 400GE
- Fibre Channel – from FC1 to FC64
- SDH/SONET – from STM-1/OC-3 to STM-64/OC-192

Matches capacity to your needs - Apollo maps the service interfaces onto secure optical wavelengths for transport between locations, with a range of transmission speeds: 10 Gbps, 100 Gbps, 200 Gbps, and even 400 Gbps. This gives you multiple degrees of freedom to carry your corporate communications traffic in a manner that best suits your needs. Multiple services can be multiplexed into a single wavelength, and of course, a fiber can carry multiple wavelengths. One thing you can count on – you will never run out of capacity.

Instantaneous response time - Optical networking is already fast. On top of that, Apollo supports a special ultra-low latency mode, removing all overhead, making it almost instantaneous. A round trip from a corporate HQ to a data center 25 Km away is less than a millisecond. This means that an Apollo optical network is not adding any time to your employees' interaction with remote data-center-based applications, or to automated applications between data centers.

Intuitive management - Apollo lets you provision and maintain your private optical network through a single, intuitive interface. This covers all aspects of adding, removing, and modifying service capabilities and underlying networking infrastructure. In addition, Apollo supports embedded optical measurement capabilities without external equipment to monitor performance, as is often required with other vendors' networks. This performance information is available through the same centralized user interface, assuring you that your network is continually operating at peak capability.

Assembles easily in modular fashion - At each site, Apollo uses compact shelves equipped with service interfaces, optical transmission, and other modules, precisely meeting the needs of each location. ECI makes it easy to implement optical networking for your enterprise.

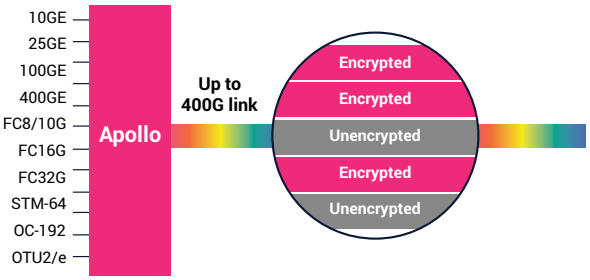
Flexible unbreakable optical encryption

Apollo protects against fiber tapping by encrypting traffic at the layer of the optical transmission, with multiple advantages:

Selective encryption - Apollo encrypts all the traffic on a given wavelength, or if there are several services multiplexed together, it can encrypt selectively, per service. This is a unique Apollo capability. For example, you may choose to encrypt all data and SAN networking traffic, but not encrypt voice traffic.

Alien wavelength capable - You can carry Apollo encrypted services or links as an alien wavelength on top of existing optical links. This lets you get started quickly with Apollo.

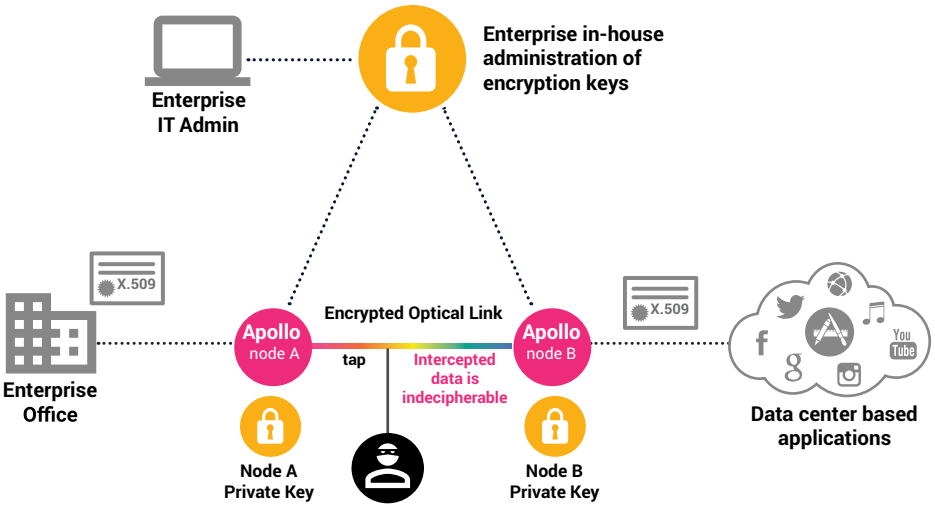
Unbreakable encryption - Apollo uses the highest level of AES-256 encoding, requiring hundreds of years of processing to decipher without the keys.



Fast and lightweight - Apollo optical encryption adds no overhead or delay to the optical transmission stream carrying the encrypted information, while other encryption methods add significant overhead and delay.

In-house key administration - All security aspects are totally under your control. This is particularly important for guaranteeing data integrity with customers and regulators.

FIPS 140-2 compliant - Provides evidence if anyone tries tampering with the encryption and key management mechanisms.



For All your Enterprise Applications

A secure enterprise optical network can provide considerable performance and cost advantages over public network or leased-line alternatives. With Apollo, you can build and tailor your network for a broad range of industries and applications – including SAN backup, point-to-point or full-mesh networking, selected optical encryption, and transport of alien wavelengths. Ribbon lets you build a private and secure enterprise network with ease and confidence.

Finance | Healthcare | Manufacturing | Retail | Research & Education | Critical Infrastructure | Government

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 rbbn.com.

Contact Us Contact us to learn more about Ribbon solutions.

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