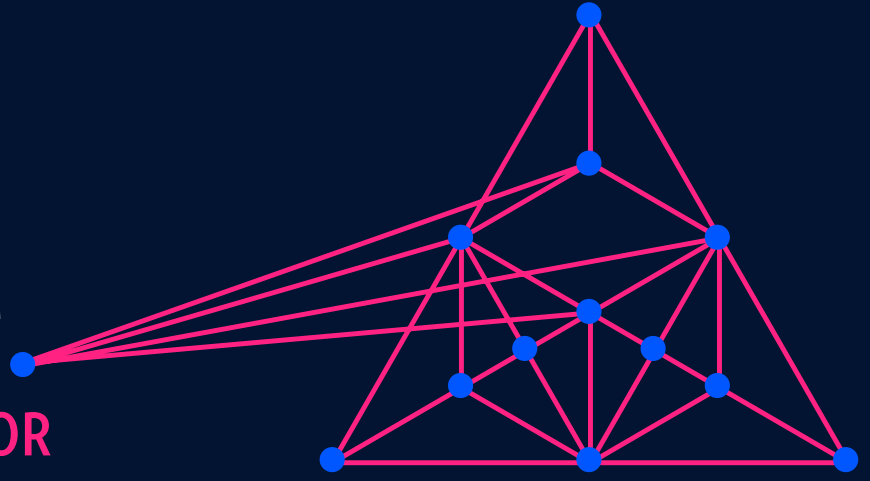


# ElastiCLOUD™

OPTICAL NETWORKS FOR RESEARCH & EDUCATION



## ENABLING HIGH-PERFORMANCE AGILE COLLABORATION

National and regional research and education networks are strategic assets that bolster economic development and are also a showcase of high tech excellence. They must support a broad range of applications – like ultra-fast high-performance computing collaboration, classroom teleconferencing, and special links with virtually zero latency. They must also promote researching and exhibiting next generation networking technologies themselves.

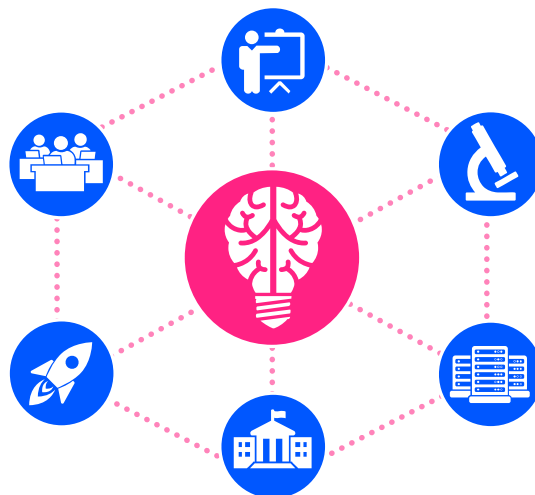
ECI is a leading supplier of optical networking solutions for Research and Education (R&E) networks. These are designed around ECI's versatile portfolio of network transport, control, and applications platforms, and feature the Apollo packet-optical transport system for high-bandwidth networking. ECI has a proven ability to deliver customized R&E optical networking solutions that combine superior performance, agility, and economic efficiency.

**Scalable**  
for a broad range  
of R&E needs

**High bandwidth**  
for demanding  
missions

**Platform for  
networking**  
innovation and experimentation

**Easy to  
operate**  
with minimal staff

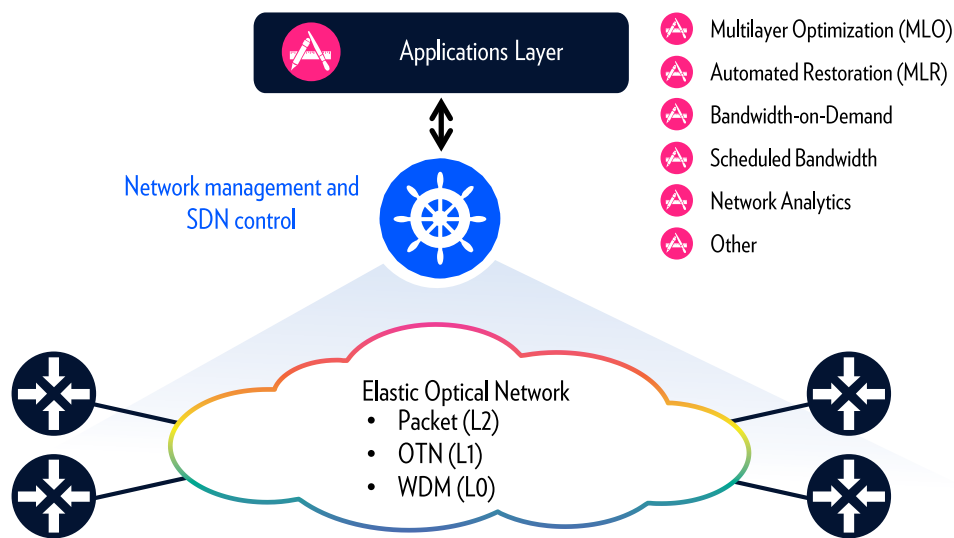


# SCALABLE AND FLEXIBLE

An R&E optical network must serve a wide variety of institutional and community customers with varying budgets and dynamically shifting bandwidth requirements.

ECI offers powerful and flexible optical networking solutions for R&E networks, based on:

- Agile packet-optical transport systems with multipurpose and common blades that enable the ability to grow per demand.
- Network function virtualization platforms that offer the flexibility to quickly and easily provision new services.
- User-friendly multilayer network management for full FCAPS (fault, configuration, accounting, performance, security) coverage.
- Real-time SDN connectivity control, and SDN applications that add flexibility to the network for bandwidth-on-demand, scheduled bandwidth, network automation, and network analytics.

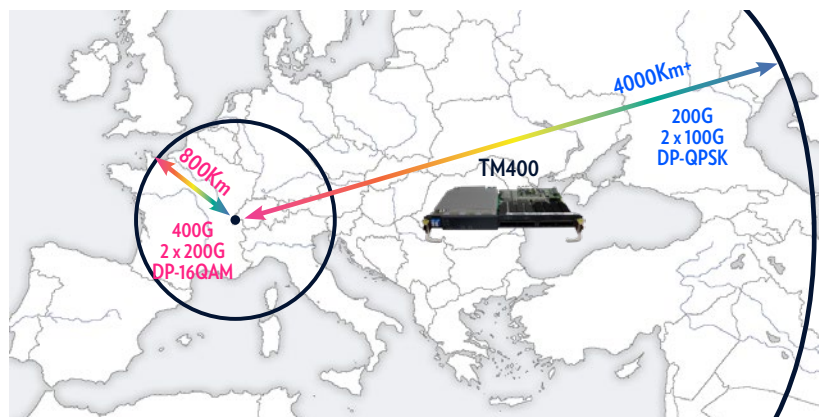


# HIGH BANDWIDTH WITH HIGH AVAILABILITY

An R&E optical network must excel in its ability to support high-performance computing collaboration and other demanding missions.

The Apollo packet-optical transport system is the beating heart of an R&E optical network. Its family of platforms seamlessly supports any point-to-point, ring, or mesh topology, extending to the network and customer edge. Apollo cutting-edge capabilities include integrated multilayer switching across the wavelength, OTN, Ethernet, and MPLS domains. Apollo also supports embedded intelligence for unprecedented visibility and control, SDN applications for dynamic services, and dynamic restoration for high availability.

Particularly noteworthy, Apollo provides blazing speed with 400G transmission, featuring rate adaptation according to distance and line conditions. Apollo has also demonstrated its path to terabit rates. For more modest solutions at the network edge, Apollo provides high-density metro-optimized 100G.



# PLATFORM FOR NETWORKING INNOVATION

An R&E optical network must support transmission and networking experimentation, with the competence to showcase special capabilities.

ECI is skilled in opening up and customizing Apollo and associated system elements, to permit the optical backbone to be used effectively for experimentation or demonstration purposes in a variety of areas, including:



**High Speed Optical Transmission** – Coherent transmission and super-channel configurations over a flexible grid, with up to 25Tbps on a single fiber.



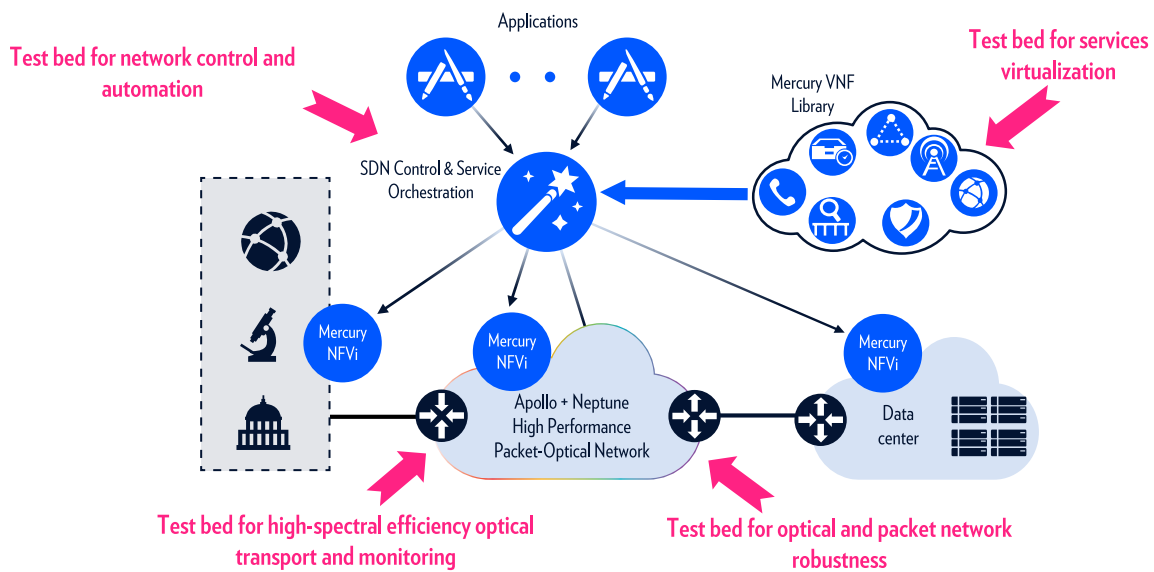
**Multilayer Networking** – Research and algorithm development for holistic operation across the WDM, OTN, and packet layers (as opposed to the current approach of one layer at a time) to optimize use of network resources and develop more effective dynamic restoration schemes.



**Software Defined Networks** – Leveraging ECI's Muse™ software suite, for centralized control and intelligence over multilayer networks to speed up service delivery, streamline and automate operations, and above all - enable new classes of bandwidth services.



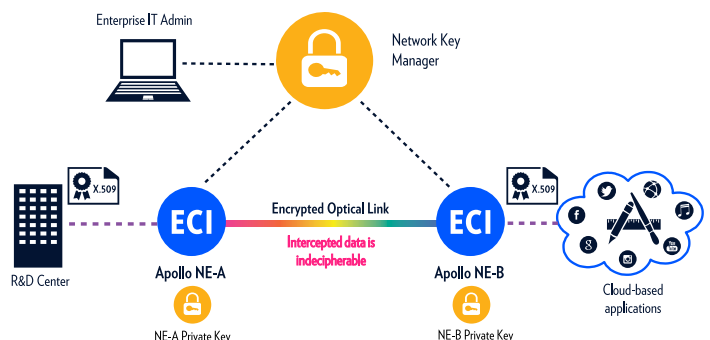
**Network Function Virtualization** – ECI's Mercury™ NFV family, which brings service agility to the network edge, can be leveraged to run multiple best-of-breed VNFs on the same platform and investigate a broad range of services and applications.



# SECURITY WITH NO OVERHEAD

An R&E optical network must protect proprietary HPC and latency sensitive applications.

Apollo supports Layer 1 optical encryption (L1OE) that protects all traffic from fiber tapping. L1OE operates at the level of 10G and 100G client interfaces at wire speed with *no overhead and negligible latency*, and uses the most secure level of AES-256 encryption, with GCM extensions.



# EASY TO OPERATE

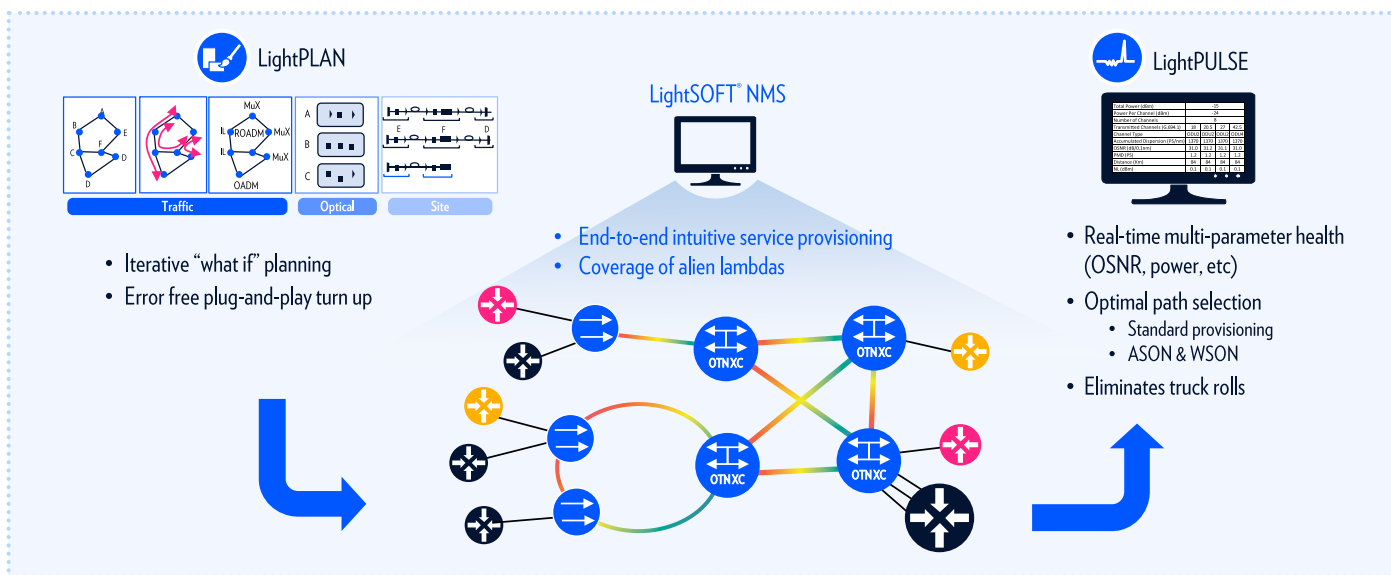
R&E network administrators must be able to manage the optical network efficiently, with a thin operations staff that may not have deep knowledge of optical networks.

ECI provides complete lifecycle support for its optical networks. LightPLAN™ performs “what if” planning to assure the most efficient configuration against traffic and networking needs. It links to centralized and local management systems for fast and error-free site turn-up.

Centralized and powerful network management by LightSOFT® covers all FCAPS functions. Featuring intuitive control, it enables point-and-click provisioning of light paths.

Premium optical performance is assured by the LightPULSE™ monitoring system. Based on integrated measurements within the Apollo nodes, it reports centrally on OSNR and other parameters along the light paths. By continuously monitoring the health of the optical network, you anticipate problems before they occur.

Sophisticated network analytic and operation automation capabilities like bandwidth on demand, service scheduling, and automation, are delivered via ECI’s Muse™ suite of SDN applications.



# OPEN

R&E optical networks must live in a multivendor environment.

ECI is deeply committed to openness. Accordingly, Apollo is totally open to and capable of transporting alien wavelengths from other vendor systems, or vice versa. In addition, LightSOFT provides a Generic EMS for managing third-party systems.

Contact us to find out how ECI can build your high-performance R&E optical network



## ABOUT ECI

ECI is a global provider of ELASTIC network solutions to CSPs, utilities as well as data center operators. Along with its long-standing, industry-proven packet-optical transport, ECI offers a variety of SDN/NFV applications, end-to-end network management, a comprehensive cyber security solution, and a range of professional services. ECI’s ELASTIC solutions ensure open, future-proof, and secure communications. With ECI, customers have the luxury of choosing a network that can be tailor-made to their needs today – while being flexible enough to evolve with the changing needs of tomorrow. For more information, visit us at [www.ecitele.com](http://www.ecitele.com)