Optical Backbone for Greek Research and Technology Network

Industry: **NREN** Region: **Europe**

Platform for ICT Innovation

GRNET, the Greek National Research and Education Network, had the objective of upgrading their optical network to create a platform on which to pioneer network and computer technologies, and enable the development of innovative ICT applications for their researchers, undergraduates, and educators. They needed an optical network that combined ultra-high capacity, multiple levels of flexibility, and an ability to be dynamically controlled.

Ribbon supplied GRNET with a state-of-the-art optical backbone as the foundation of the network. The backbone combines high transmission speed, flexible optical routing, centralized management, and value-added applications for bandwidth control. Living up to Ribbon's elastic networks promise, the backbone is easily upgradable for higher capacities and to support programmable SDN control. The new optical backbone allows GRNET to excel at meeting the needs of their end-users, today and well into the future.

GRNET Optical Backbone

- Serves over 1 million users, encompassing 100 major institutions and 15K schools, in Greek education and research
- Platform for Internet connectivity and advanced ICT services
- 35 POPs with over 9,000 km of fiber
- Part of European GÉANT network

Challenges

GRNET's objective has been the provision of an advanced infrastructure throughout Greece for pioneering network and computing technologies, and to develop innovative applications that promote the importance and value of ICT in citizens' lives. To support this they required an optical network with capabilities and services beyond those provided by commercial networks.

> "We needed to upgrade our optical backbone to extend the very latest in information and communications applications to our expanded user community from research, education, health, and cultural institutions in Greece. Ribbon's solution combined outstanding performance and flexibility, to realize the new-generation optical backbone."
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> — **Dr. Panayiotis Tsanakas**
> Chairman & CEO, GRNET

The goal was to provide advanced dynamic bandwidth control and reservation services, and optical-level sharing services for research, all manageable through a user-friendly interface. To this end they needed an optical network that supported direct management by end-users, ultra-high capacity services to 100Gbps, smart management of available capacity, rapid provisioning of optical paths, and configuration of virtual sub-networks at an optical level.

Case Study

Ribbon Solution

Ribbon met these challenges by equipping GRNET with an optical backbone based on its Apollo packet-optical transport system. The entire network was upgraded to 10G or coherent 100G optical links to fulfill existing traffic needs, and is capable of being upgraded further to 200/400 Gbps to meet future requirements. The links provide efficient OTN transport for a full range of client interfaces that GRNET extends to its users, including Gigabit Ethernet, Fibre Channel, video, and TDM. They also provide wavelength services directly to end-users to support unique R&D requirements. Apollo optical links also handle alien wavelengths transparently to support smooth migration from existing services.

Ribbon provides flexibility within the optical backbone using colorless and directionless ROADMs. These enable end-to-end wavelength routing without the need for expensive optical conversion. The ROADMs allow programmable optical reconfiguration, for bandwidth-on-demand services and dynamic restoration capabilities.

Ribbon extends control of the optical backbone through its Muse™ lifecycle automation software suite, which includes the LightSOFT® NMS. This provides a centralized interface for end-to-end service provisioning, configuration, maintenance, and fault management. Notably, the optical performance of a lightpath can be measured along its entire span without the need for on-site test equipment.

For automation, Muse provides calendar-based bandwidth services for pre-scheduled needs like data backups. Ribbon also worked with GRNET to extend northbound interfaces from Muse to GRNET OSS, to implement automated provisioning and extend control to end-users.

Benefits

GRNET's upgraded modern ultra-high capacity optical network is the foundation of an integrated environment and advanced applications that enables Greek researchers, undergraduates, and educators to perform their tasks in optimal form. It provides the flexibility and control to customize services to meet the needs of different clients, and to ensure the availability and integrity of data across GRNET data centers. It promotes Greece's position as an NREN leader and facilitates collaboration with other NRENs.

High Performance
computing collaboration

Automated
with end-user control

Easy to Operate
with a minimal staff

Platform for R&E
innovation

Contact Ribbon to find out how to accelerate your high-performance Research & Education Network at rbbn.com

About Ribbon

Ribbon Communications (Nasdaq: RBBN), which recently merged with ECI Telecom Group, delivers global communications software and network solutions to service providers, enterprises and critical infrastructure sectors. 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 IP solutions, UCaaS/ CPaaS cloud offers, leading-edge software security and analytics tools, as well as packet and optical networking leveraging ECI's Elastic Network technology.