

Optical Layer for Dutch Research and Education Network

Industry: **NREN**

Region: **Europe**

High-Speed ICT Innovation Platform

SURFnet is the Dutch National Research and Education Network (NREN). Their goal is to expand the network's performance and reliability to exceed the expectations of their demanding connected institutions for running Information and Computing Technology (ICT) applications. SURFnet also wants to introduce new capabilities such as Network Function Virtualization (NFV).

Ribbon is supplying SURFnet with a state-of-the-art optical backbone. This enables SURFnet to meet their end-customer service, performance, and operational goals, well into the future. The new optical layer enhances existing capabilities in multiple dimensions, including bandwidth capacity, optical routing flexibility, dynamic restoration, and optical encryption with no added latency.

"Of the nine candidates for this tender, we selected Ribbon as they offer an unrivaled combination of advanced capabilities and service along with the possibility to quickly, easily and cost effectively migrate to 400G, as future requirements may warrant. Excellent support of alien wavelengths was another winning factor. We are delighted to partner with Ribbon so that we may continue to provide the very best to the Dutch education and research community."

— **Jac Kloots**
Project Manager at SURFnet

SURFNET8 Optical Layer

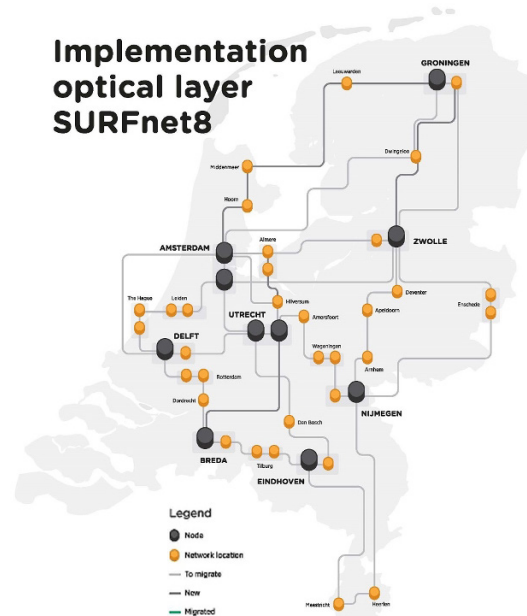
- Serving over 190 institutions and 1 million users in Dutch education and research
- Platform for ICT connectivity and innovation
- Part of European GÉANT network, and collaboration with other NRENs
- Over 11,000 km of fiber
- Coherent transport at 100/200/400 Gbps

Challenges

SURFnet set multiple requirements for their new optical backbone. To begin with, it should combine high performance with economical scalability for handling different volumes of traffic from connected institutions, whether they are located on a campus, in a city center, or are virtualized in a data center. This must be complemented by ease of operation, since SURFnet is supported by a thin operations staff, with limited optical expertise. It should also support smooth migration from the previous optical infrastructure, including re-use of selected facilities.

To maintain high service availability to connected institutions, the upgraded optical backbone must provide real-time restoration mechanisms to recover from fiber breaks and equipment failures. It also needs to support specialized photonic services for R&E applications, for example requiring ultralow latency, that go beyond traditional optical connectivity.

Implementation optical layer SURFnet8



Ribbon Solution

To meet these challenges and equip SURFnet with a state-of-the-art optical backbone, Ribbon is deploying its family of Apollo packet-optical transport platforms. Ribbon used the LightPLANTM planning tool, to investigate and architect SURFnet's optical layer, to deploy Apollo in an optimal way, balancing existing traffic needs and anticipated growth. Apollo makes available a full range of Gigabit Ethernet, Fibre Channel, Video, and TDM client interfaces to SURFnet customers. It connects the institutions using coherent 100 Gbps optical transport, upgradable to 200/400 Gbps, satisfying any bandwidth capacity need.

For optimal transport efficiency, Apollo employs colorless and directionless optical switching in SURFnet, for end-to-end wavelength connectivity, without the need for expensive O-E-O regeneration. These same capabilities support dynamic wavelength restoration in the event of fiber breaks, meeting high service-availability requirements.

The LightSOFT® network management system provides SURFnet's small operational team with an intuitive GUI-based interface for rapidly adding/deleting wavelengths, and overall network care. One distinctive feature is embedded optical performance measurements and centralized monitoring for early detection of potential problems, without added test equipment. LightPULSE centralized optical performance monitoring also provides the intelligence for optimal path selection in the case of wavelength rerouting.

To support smooth migration, Apollo effortlessly transports selected alien wavelengths from the previous optical network. As a value-added capability to SURFnet's customers, Apollo implements optical encryption at the client level to protect sensitive communications.

Benefits

SURFnet's upgraded optical layer provides its service layer the freedom to innovate, develop, and use leading-edge ICT applications, including new approaches based on NFV. It facilitates R&E end-users creating and managing services, with confidence of high performance and reliability. The optical backbone can extend to interwork with other NRENs for collaborative projects, and maintains SURFnet's position as leader among research and education networks worldwide.



High Performance
computing
collaboration



Dynamic Restoration
for high service
availability



**Independent
Evolution**
from service layer



Platform for R&E
innovation and
experimentation

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.

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