Connecticut Education Network

SCIENTISTS AND STUDENTS DISCOVER AND LEARN WITH FAST, RELIABLE ACCESS FROM THE 100 GBPS CONNECTICUT EDUCATION NETWORK

Summary

Company:
Connecticut Education Network (CEN)

Industry:
Education

Business Challenges:
- *Provide affordable Internet and network services to higher education, K-12 schools, libraries, and municipalities*
- *Support data-intensive research and scientific collaboration across institutions*

Technology Solution:
- *QFX10002 and QFX5100 Switches*
- *EX4600 and EX3400 Ethernet Switches*
- *MX960 and MX480 5G Universal Routing Platforms*

Business Results:
- *Enable research collaboration with a high-speed, low-latency Science DMZ*
- *Connect 200 K-12 schools, 150 libraries, 39 higher education institutions, 100 municipalities, and 10 government agencies*
- *Offer high-speed Internet, private Ethernet, and other network services to members at an affordable price*

The Connecticut Education Network (CEN) delivers reliable, high-speed Internet access, data transport, and a broad range of network and cloud services to its members throughout Connecticut at affordable rates. Established in 2000, CEN helps deliver on the promise of digital equity in education by providing affordable access to technologies for schools and libraries. CEN connects 200 K-12 schools, 150 libraries, 39 higher education institutions, 100 municipalities, and 10 government agencies across the state. CEN was the first statewide K-12 and higher education network built exclusively using state-of-the-art fiber optics, and CEN continues to provide leading-edge network services.

Business Challenge

Data-intensive collaboration was growing across Connecticut's research and education community and with peers at national and international institutions. University of Connecticut (UConn), CEN, and Internet2 wanted to upgrade the Science DMZ connection between UConn's main campus in Storrs, CT and the UConn Health Center in Farmington, about 35 miles away.

"We wanted to enhance the capabilities of researchers to host data and share data with researchers in other institutions, which can benefit a larger community of researchers," says Ryan Kocsondy, director of CEN.

A Science DMZ is a portion of the network, built at the campus network edge, that's designed to support high-performance applications, rather than general-purpose business systems. The Science DMZ model is used to support high volume bulk data transfer, remote control over experiments, and data visualization.

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- Rob Vietzke, Vice President of Network Services, Internet2

Technology Solution

CEN chose Juniper's Science DMZ solution. Juniper Networks® MX960 and MX480 5G Universal Routing Platforms are used as high-speed border routers, while the QFX10000 line of switches and EX4600 Ethernet Switches are used to connect to high-performance computing clusters, storage workloads, and data transfer nodes. EX3400 Ethernet Switches are deployed at the libraries.

MX Series routers deliver industry-leading system capacity, density, and performance. The MX960 router delivers over 10 Tbps of system capacity, while the MX480 router delivers almost 6 Tbps of system capacity. The QFX10000 line of modular data center Ethernet switches scales from 3 to 96 Tbps of throughput, while the high-performance, low-latency QFX5100 switches deliver 10GbE/40GbE/100GbE performance.

Juniper Networks Junos® operating system is the single operating system that powers Juniper's routing, switching, and security products. Built with reliability, security, and flexibility as its core principles, using Junos OS delivers a significant advantage by providing the power to automate network operations.

"With a Juniper network, CEN is able to meet our members' need for higher capacity Internet connectivity and advanced network services while enabling CEN to deliver these services efficiently."

- Ryan Kocsondy, Director, CEN

By building a better Science DMZ network with Juniper, CEN has a high-speed, low-latency connection to Internet2 that is designed for scalability, density, and flexibility. The Science DMZ is designed to meet the unique characteristics of research data. For example, scientific flows are far less predictable than typical corporate traffic, and many research applications produce short bursts of massive flows that saturate links for short periods of time.

Integration Partners, a network engineering firm based in New England, worked closely with CEN, from architectural design through to procurement and deployment. IPC was instrumental in creating the business model for member offerings, and provides Junos OS training to the CEN staff and member community. The relationship is built on integrity and a deep understanding of CEN's business and challenges as well as engineering excellence with Juniper products.

Business Results

"With a Juniper network, CEN is able to meet our members' need for higher capacity Internet connectivity and advanced network services while enabling CEN to deliver these services efficiently," says Ryan Kocsondy, director of CEN.

The CEN-Internet2 network is the foundation for enhanced collaboration among research institutions. As high-performance integration of compute and big data become central to scientific breakthroughs, improvements to the network have strategic importance. By building a better network with Juniper, CEN can offer high-speed, highly reliable Internet and other network and cloud services to higher education institutions, K12 school districts, libraries, and municipal governments across the state.

"UConn approached Internet2 because their data-intensive research needs were growing exponentially each year and, as a result, they needed a superior network to carry out their work," says Rob Vietzke, vice president of network services at Internet2. "UConn is now directly connected to the most advanced global fabric of research facilities available, which will enable the university to accelerate its cutting-edge research in biological and physical sciences."

The 100 Gbps CEN-Internet2 link has broad impact across UConn:

- The geography department can continuously access high-resolution satellite images stored at external servers.
- The molecular and cell biology department can transfer huge genome sequences produced by next-generation sequencers and process the outputs within campus and external sites.
- The physics department can transfer terabytes of data to and from the Open Science Grid, within a day.
- The statistics department conducts research on high-dimensional statistical modeling and inference using large data sets produced by health and biomedical studies.
- UConn Health can conduct research on quantitative cell biology and simulations as well as computational genomics, which require terabytes of data transfer on a daily basis.

Beyond supporting the university's research agenda, migrating to a Juniper network enabled CEN to offer increased capacity up to 1 Gbps to individual member sites as well as increase the overall backbone capacity to 10 and 20 Gbps. It was also able to offer new in-demand services such as Layer 2 VPN and private Ethernet services.

CEN's ability to deliver affordable, higher capacity Internet and other network services to K-12 schools is critical to support digital learning initiatives equitably across the state. It is essential that network operations are stable and reliable, so there are no disruptions during online assessments as students prepare for college and careers.

All towns and regional counsels of government also have access to CEN, which increases the state's investment in the network and makes it possible to share applications and other resources.

Next Steps

CEN continues to innovate as it supports the digital transformation of education, state and local government, and public safety agencies. By offering affordable access to high-speed connectivity, CEN is powering the future of digital learning and smart government across Connecticut.

For More Information

To find out more about Juniper Networks products and solutions, please visit www.juniper.net.

About Juniper Networks

Juniper Networks brings simplicity to networking with products, solutions and services that connect the world. Through engineering innovation, we remove the constraints and complexities of networking in the cloud era to solve the toughest challenges our customers and partners face daily. At Juniper Networks, we believe that the network is a resource for sharing knowledge and human advancement that changes the world. We are committed to imagining groundbreaking ways to deliver automated, scalable and secure networks to move at the speed of business.

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