

SOLUTIONS IN ACTION

Real-world examples of how leading companies benefit from Juniper Networks innovative solutions

SUCCESS
STORIES



Department of Energy Extends Scientific Exploration with Massive Data Transfers



Business: Scientific Research for the Department of Energy (DOE)

Size: As many as 100,000 scientists and staff from more than 40 DOE sites and 100 strategic partner networks

Web Site: www.es.net

Funded by the Department of Energy (DOE), the Energy Sciences Network (ESnet) provides direct, high-performance connections that facilitate communication and collaboration among leaders in the scientific community. Linking thousands of researchers at national laboratories, universities, and other institutions to massive amounts of scientific data is a daunting task. And it's grown more challenging with the development of ever more sophisticated research tools.

The need to upgrade the ESnet OC192 network to a 10 Gbps Ethernet infrastructure became abundantly clear with the introduction of the European Organization for Nuclear Research's Large Hadron Collider (LHC)—which helps physicists unlock some of the mysteries of the universe. ESnet is the sole conduit for U.S. researchers accessing LHC data. By 2010, it is anticipated that LHC will generate and move 100 Gbps of nonstop

data. "We had to upgrade the network to support the existing gigabytes of traffic, in addition to the data coming from the LHC," said Kevin Oberman, senior network engineer at ESnet. "We needed a routing platform that fit our budget and would do the job."

With a critical need for the exceptional performance and a flexible architecture that could support advanced services such as IPv6 and MPLS, ESnet turned to Juniper Networks MX Series Ethernet Services Routers. The MX960 router, one of the industry's largest capacity carrier platforms, and the MX480 router provide carrier-grade reliability capable of handling unprecedented amounts of data throughput. They also provide high availability features such as Non-Stop Routing (NSR) and MPLS fast reroute that ensure the network is always running.

The use of pseudo-wires allows for a dynamically provisioned QoS path that helps overcome the network latency issues that can make it difficult to transfer massive data sets within a specified time frame across multiple domains. Researchers can reserve a predetermined amount of bandwidth using the On-Demand Secure Circuits and Advance Reservations System (OSCARS), guaranteeing timely delivery of their data.

THE ESnet STORY

Business Problem

ESnet, the Department of Energy network that supports vital collaboration on large-scale science research projects, needed a flexible routing solution capable of reliably transporting multiple 10 Gbps information streams.

Operational Hurdles

Network latency makes it difficult and expensive to transfer massive amounts of data—often in excess of 1 Gbps—within a set time frame and across multiple domains.

Solution

ESnet deployed Juniper Networks MX960 and MX480 Ethernet Services Routers and EX4200 Ethernet switches to support IP/MPLS and IPv6, as well as pseudo-wires that support an on-demand, circuit reservation scheme.



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ESnet also deployed Juniper Networks EX4200 line of Ethernet switches that make it easy to manage and deploy a more energy-efficient network. The switches provide 1 Gbps access to the diverse labs and universities that analyze LHC data. As performance needs increase, ESnet can grow incrementally thanks to Virtual Chassis technology that allows up to 10 switches to be interconnected and managed as a single, logical device. This also simplifies management of the switches—a key factor since hubs are scattered all over the country.

With JUNOS® Software running across its core router and switch platforms, the

network engineering staff can quickly and efficiently keep up with changing business demands.

As ESnet prepares to handle even more large-scale science projects—including major telescope projects that will bring in vast amounts of astrophysics data—bandwidth, reliability, high availability, and operational efficiencies become more critical. “We’ve only begun to grow,” said Oberman, “and we’re only going to get bigger.” With Juniper Networks as its partner, ESnet is well positioned to address the challenges posed by increasingly massive data transfers. **VEER**

“We have a unique customer set that requires the ability to handle large data flows. The Juniper MX Series allowed us to create a highly reliable IP infrastructure that is cost-effective, flexible, and supports the software we’ve developed.”

– Steve Cotter,
Department Head, ESnet

ESnet RESULTS AT A GLANCE

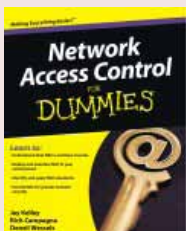
- Reliable, high-speed connectivity among U.S. and strategic international labs and universities.
- Seamless, cost-effective deployment of Ethernet in just five months.
- Superior QoS that provides appropriate levels of quality, regardless of traffic.
- On-demand provisioning of guaranteed bandwidth.
- Reduced capital and operational expenditures through energy efficiency.

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HOT OFF THE PRESS

HOW TO EXTEND YOUR NETWORK SECURITY



Network Access Control for Dummies

By Jay Kelley,
Rich Campagna, and
Denzil Wessels

ISBN: 978-0-470-398678

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378 pages

If you’re interested in researching or implementing a network access control (NAC) solution, this is the book for you. Authored by three Juniper Networks managers, *Network Access Control for Dummies* provides an excellent overview of how a comprehensive, standards-based NAC solution works. You’ll

learn how to ensure a successful deployment and take real-world challenges in stride—all in the simple, straightforward style of the popular *Dummies* series.

This informative text will walk you through crucial steps for assessing, evaluating, remediating, enforcing, and monitoring your NAC program, as well as how to determine the best approaches for your specific organization. You’ll also gain an understanding of essential functions of authentication, authorization, and accounting, plus discover how to set policies that are enforceable, reasonable, and effective. Finally, you’ll find valuable tips and techniques for involving and motivating anyone whose support is critical to a successful implementation.

About the Authors

Jay Kelley is Product Marketing Manager for the Juniper Networks Unified Access Control solution. Rich Campagna is Product Line Manager for Juniper Networks UAC and SSL VPN product families. Denzil Wessels is Technical Marketing Manager and oversees technical marketing for Juniper Networks UAC and SSL VPN.

For more information on this book and all the others in the Juniper Networks Library, go to www.juniper.net/books.