

Rural Virginia utility modernizes smart grid with help from Juniper SRX



Central Virginia Electric Cooperative first brought electricity to homes, farms, and businesses in rural Virginia in 1937. Today, the member-owned utility serves 40,000 members in 14 counties and offers fiber-to-the-home Internet service through a subsidiary, Firefly Fiber Broadband.

CVEC is utilizing the fiber network to modernize its electric grid, improve service to its members, lower operational costs, and meet growing demand for renewable energy. CVEC relies on Juniper SRX firewalls to securely connect the substations in its grid with downline equipment such as recloser switches, regulators, and other supervisory control and data acquisition (SCADA) monitoring devices and controllers.

OVERVIEW

Company	Central Virginia Electric Cooperative
Industry	Energy and Utilities
Products Used	SRX300, SRX345, SRX380, vSRX
Region	Americas

CUSTOMER SUCCESS AT-A-GLANCE

40,000

Accounts in rural Virginia served by CVEC

Secure

Communications from field to system control center

50%

Lower total cost of ownership out of other solutions considered

1 hour

Average drive time per location eliminated for repairs in the field with remote management

CHALLENGE

Rural utility looks to lower costs and save on truck-roll time

CVEC is making its grid smarter, more resilient, and less expensive to maintain. The foundation of CVEC's smart grid technology is a secure IP network that can be used to restore service after outages, balance power loads, and use resources more efficiently.

"The challenge was how to connect downline devices in a secure and reliable way," says Jeff Harris, Network Engineer at CVEC. "Most of these devices, like high-voltage electric reclosers and automatic voltage regulators, are in remote areas or in boxes hanging on poles."

CVEC needed to connect its substations and the downline devices that control energy distribution and send power to members' homes and businesses. The IT team sought a secure IP network solution that would stand up to harsh environmental conditions, impervious to



heat or cold. The solution also needed to use direct current (DC) power.

Simplicity was a key consideration. Utility technicians would have to be able to deploy and manage the secure network devices themselves without expert network skills.

As a member-owned, not-for-profit organization, affordability was paramount. “We needed a solution that was affordable at scale, because we needed hundreds of devices,” says Harris.

SOLUTION

Secure communications for greater agility

CVEC tried several remote connectivity options, but found they were too expensive, too complex, or changed the design of the network altogether. The Juniper line of SRX300 Firewalls checked all the boxes to securely connect downline devices, ultimately allowing them to be remotely managed and maintained by the CVEC IT and engineering staff.

The SRX300 delivers next-generation security, LAN, and WAN capabilities, and its small form factor fits into a utility cabinet. MACsec security provides point-to-point encryption on Ethernet links, and CVEC can easily consume advanced security services when needed. CVEC also can run the Juniper vSRX Virtual Firewall on its industrial-grade switches in the field.

“The SRX300 offered the lowest total cost of ownership out of all other solutions when we explored,” says Harris. “There’s usually a tradeoff between time and money, but the SRX saves us both. The SRX is a win-win.”

OUTCOME

Improve grid uptime and reliability

CVEC is at the start of a multiyear journey to make improvements to its power grid that will benefit people and businesses for decades to come.

“Secure connectivity with Juniper will give us better visibility and ultimately the ability to remotely control downline devices,” says Joel Wendland, Network Engineer at CVEC. “The key benefit we expect is improved uptime and reliability for our members.”

A smart grid can shorten the duration of power outages and allow its residential, agricultural, and business members to take greater advantage of grid connected renewable generation, battery storage, and electric vehicles.

In addition to restoring power faster after an outage, CVEC expects the smart grid project to make technicians more productive.

“Before, a technician would have to drive to the location of the outage, which might be in the mountains,” says Wendland. “The tech would have to clear the outage and then drive to the recloser location, close it out, and re-energize the line. But with our downline devices connected by SRX firewalls, our control center can make repairs remotely and restore service faster.”



“As one of the first rural cooperatives to have a systemwide fiber network, we wanted to optimize the benefit to all members. One of the first ways to improve electric operations was to focus on improved service restoration and reliability. Our innovative IT team took on the challenge of connecting our downline devices cost-effectively and securely. Their use of the Juniper devices helps us reach our goals.”

Gary Wood
President & CEO, Central Virginia Electric Cooperative

Corporate and Sales Headquarters

Juniper Networks, Inc.
1133 Innovation Way
Sunnyvale, CA 94089 USA

Phone: 888.JUNIPER (888.586.4737)

or +1.408.745.2000

www.juniper.net

APAC and EMEA Headquarters

Juniper Networks International B.V.
Boeing Avenue 240 1119 PZ Schiphol-
Rijk

Amsterdam, The Netherlands

Phone: +31.207.125.700



Copyright 2023 Juniper Networks, Inc. All rights reserved. Juniper Networks, the Juniper Networks logo, Juniper, and Junos are registered trademarks of Juniper Networks, Inc. in the United States and other countries. All other trademarks, service marks, registered marks, or registered service marks are the property of their respective owners. Juniper Networks assumes no responsibility for any inaccuracies in this document. Juniper Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.