



**VyOS**  
Networks



**/** VYOS SUCCESS STORY

# Hydro Québec Research Institute Uses VyOS to Explore IPv6, SRv6, and Next-Generation Telecom Networks

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## Customer Overview

Hydro Québec is one of the largest electric utility companies in North America, delivering electricity to millions of customers in Canada. Through its research arm, Hydro Québec Research Institute (IREQ), the organization evaluates advanced technologies that can support the future of critical infrastructure.

Within the Digital Systems Unit, researchers explore telecommunications and networking capabilities for modern power grids, including wireless networks, 5G, SDN, and IPv6-based architectures. To support this work, the lab adopted VyOS as a flexible routing and networking platform for research, validation, and training.

## The Challenge

IREQ operates in an experimental environment where emerging technologies must be evaluated and understood before they can be considered for production use in critical infrastructure. The lab needed a platform that could:

- **Support multiple networking roles**, including firewalling, edge routing, VPN, and BGP
- **Enable IPv6-first and dual-stack architectures** for realistic design validation
- **Support early SRv6 experimentation** for future segment routing use cases
- **Connect to the public internet** using an independent AS and multi-provider BGP
- **Stay fast to deploy and flexible** to support rapid iteration in a lab setting
- **Provide a realistic training environment** for engineers working on next-generation designs

Traditional appliances and rigid platforms made it harder to move quickly or experiment freely.



## Why VyOS

VyOS stood out as an adaptable network operating system that fits research and innovation workflows. Hydro Québec selected VyOS because it provides:

- **A true multi-role networking platform** in a single OS
- **Strong IPv6 support** with a clear path toward SRv6 experimentation
- **Linux-based flexibility** aligned with lab workflows and rapid iteration
- **The ability to model real-world edge and routing scenarios** with realistic topology design
- **High-quality documentation** that supports independent exploration and reduces dependency on vendor support



## Implementation

VyOS is deployed throughout the lab primarily as virtual machines, enabling researchers to spin up routers quickly and build complex topologies without dedicated hardware. Current lab use cases include:

- **Edge routing with BGP**, including multi-provider connectivity
- **IPv6 and dual-stack architectures** for next-generation designs
- **Early-stage SRv6 experimentation** for segment routing evaluation
- **Network segmentation and slicing scenarios**
- **VPN and secure connectivity testing**

VyOS is also used as a progressive training platform, helping engineers build proficiency in advanced networking concepts before validated designs are handed over to production-focused teams.

## Results

By standardizing on VyOS in the research environment, Hydro Québec achieved:

- **Faster experimentation cycles** with easier iteration on network designs
- **More realistic validation** of advanced routing and IPv6-based architectures
- **Broad protocol coverage** using one consistent platform
- **Reduced tooling complexity** across the lab environment
- **Minimal dependency on vendor support** thanks to strong documentation

The team emphasized that VyOS enables them to focus on research goals rather than tooling constraints.

## Operational and Strategic Impact

VyOS now plays a central role in IREQ's roadmap to de-risk new network capabilities before they reach critical operational environments. Planned initiatives include:

- **Deeper SRv6 experimentation** for traffic steering and quality control
- **Public IPv6 connectivity** using dedicated address space
- **Integration with private mobile network infrastructure** (4G/5G)
- **Preparing validated architectures** for future production adoption in critical infrastructure

By using VyOS in the research phase, Hydro Québec can reduce risk and build confidence before introducing new technologies into production networks.





*VyOS is one of my main tools for networking. It works, it's flexible, and it lets us experiment without slowing us down.*

— Jean-Guy Quenneville - Researcher, Telecommunications and IT, Hydro-Québec Research Institute (IREQ) Digital Systems Unit

