



Customer Success Story

Canadian Network Connects 150,000+ Providers

Executive Summary

Customer Name

Smart Systems for Health Agency (SSHA)

Industry

Healthcare

Business Challenge

- Securely connecting 150,000 healthcare providers across 24,000 sites
- Confidentiality of patient information and the mission-critical nature of healthcare applications
- Provide quick and secure ways to share vital patient information anywhere, anytime

Network Solution

- To achieve the necessary reliability, redundancy, and fault-tolerance, SSHA established dual data centers located in separate geographic areas.
- Province-wide WAN based on Cisco MPLS, routing, switching, and security technology

Business Value

- Enables faster, more efficient communications
- Ability to add IP-based communications to further streamline support services
- Enables a province-wide telehealth program to service remote communities
- Cost savings

Agency Delivers World-Class, Secure, Dynamic, Common-Use Networks and Infrastructure

Background

Over the past three years, Canada's most populous province has been building a world-class communications and technology infrastructure that will change the way it practices healthcare.

Founded in 2003, Smart Systems for Health Agency (SSHA) has developed a secure, integrated and province-wide information technology infrastructure to connect all sectors of the health system. When fully deployed, SSHA will connect more than 150,000 healthcare providers, physicians, community care providers, hospitals and laboratory personnel, pharmacists, and public health professionals, in 24,000 sites throughout Ontario.

This will improve the way that health information is shared and enhance the delivery of care to Ontario citizens. SSHA will lay the foundation for Ontario's ambitious e-Health strategy by providing quick and secure ways to share vital patient information anywhere, anytime in Ontario.

Challenge

The confidentiality of patient information and the mission-critical nature of healthcare applications made security, reliability, and availability central to the development of the SSHA network.

Before SSHA could sell the idea of providing access to sensitive information through advanced applications like Electronic Health Records (EHR), it needed to ensure the service would be as secure as it was accessible.

"Security, quality and reliability are absolutely fundamental. We needed a world-class infrastructure that would be the foundation of our services, a place to house our applications, provide province-wide network access, secure e-mail, a Public Key Infrastructure, and portal services to support the emergence of electronic healthcare communities," says Mike Monteith, chief architect for SSHA.

"In Ontario, whenever you go to a doctor, information from the visit will pass through SSHA, whether it's lab orders, electronic health record searches, or other requests. So we needed to build an absolutely reliable environment with fault-tolerance and redundancy," says Mauro Lollo, chief technology officer at UNIS LUMIN, which provides consulting and integration services for SSHA. "The essential requirement was to build a bulletproof network to ensure maximum uptime and transparency from a failover perspective."

“Common-use networks and infrastructure are the wave of the future. At SSHA we’re making the future a reality today. This innovative infrastructure will enhance healthcare for the benefit of all Ontarians and create a benchmark for e-Health across Canada.”

— Mike Monteith, Chief Architect for Smart Systems for Health Agency

Solution

To achieve the necessary reliability, redundancy, and fault-tolerance, SSHA established dual data centers located in separate geographic areas. In the event of a natural disaster, blackout, or power interruption, network and infrastructure service will not be compromised.

The data centers are linked by a dark fiber, private optical data network which provides local area network (LAN) backbone services across the two centers, creating a single logical hosting environment. The networked data centers serve as a platform for launching a secure network, contact center services, application hosting services, secure e-mail, security, and authentication services.

Healthcare providers accessing SSHA services will exchange personal health information over an IP-based managed private network with secure Public Key Infrastructure (PKI) encryption and authentication. The hospitals, clinics, labs, doctors’ offices, and other healthcare organizations access the data centers by connecting to points on the province-wide network provisioned by a number of national telecommunications providers including Bell Canada, Allstream, and Hydro One Telecomm.


A redundant optical network runs between the data centers on primary and secondary paths approximately 100 kilometers each. “We’re leveraging a redundant dense wavelength-division multiplexing (DWDM) infrastructure between the two data centers to bridge them and create one logical hosting environment,” says Mike Monteith. “At the core of our data center is a series of Cisco® Catalyst® 6500 switches that provides the LAN backbone services spanning the two data centers. We’ve created a highly available LAN backbone that partitions the logical view of the data center into multiple zones.”

The centers were also built with ample “head room” to handle extremely high traffic volumes, while providing for future growth. “The infrastructure was built with scalability in mind,” says Lollo. “It’s a modular design, so SSHA can add capacity as they go, without having to shut anything down or take key services offline.”

While the data centers house equipment from a number of different vendors, the Cisco intelligent network technology was fundamental to the initiative’s ongoing integrity and security. “A significant portion of our WAN is based on Cisco Multiprotocol Label Switching (MPLS) technology so we can create a virtual private network over our carrier’s backbone, ensuring quality of service, high speed, and reliability. This intelligence allows us to ensure that sensitive, health-related traffic is logically isolated from other traffic on the network and remains secure,” says Monteith.

Cisco provides the data centers with advanced switching capabilities, using Layer 2 and Layer 3 switching, load balancing, plus PIX® firewalls, access technology, and other Cisco technologies. Close to 100 discrete Cisco pieces are housed in the data center environments. “We chose Cisco products because we felt they were best-of-breed for the data center-scale implementation and for integrating with our existing investment in Cisco infrastructure,” says Monteith.

In addition to high availability, SSHA provides several layers of security through advanced authentication, data encryption, firewalls, and intrusion-detection capabilities to ensure the security and privacy of the information assets and services in the data centers. These include Cisco PIX-535, high-performance, modular firewalls with the capability to handle more than 500,000 simultaneous sessions. Delivering enterprise-class security, they provide the highest levels of performance, port density, reliability, and investment protection.



SSHA has built an infrastructure with an environment surrounding it that is “second to none,” according to Lollo. “It is a truly world-class infrastructure, on par with anything used by the world’s largest financial institutions. The only environment I can think of that rivals it, in terms of high security and availability, is the military.”

Results

While there were some initial concerns about challenges in getting all of the components to work together, the data centers are functioning well with no interruptions in availability, reliability, or security. SSHA has had successful pilot implementations with various user groups, including hospitals, community care access centers, public health units, and physicians. A province-wide telehealth program provides distance consultation services to thousands of patients per year using SSHA’s infrastructure, enabling patients to receive highly specialized care while remaining in their rural and distant communities.

Using a collective approach to IT infrastructure, Ontario healthcare providers can cost-effectively deploy new applications, share resources, and provide smaller communities with access to communication resources they could never afford to build on their own.

By consolidating many types of healthcare communications onto a central networking solution, SSHA will realize significant savings on support costs. Network administration, application adds, application changes, and troubleshooting can now be centrally managed. In addition, the unique dual data center solution can easily handle spikes in transaction volumes during a busy holiday season or a health crisis. Most importantly, sensitive patient health information can be securely shared over virtual private networks (VPNs).

SSHA is ultimately enabling faster, more efficient communications province-wide as well as within and between various communities of users. Secure e-mail messaging, one of the first applications hosted by the data centers, will give many healthcare providers across the province the first common forum for exchanging information and sharing opinions regarding patient care. The data centers are also now hosting a PKI for security authentication and a portal platform that will enable healthcare providers to build Web sites.

“One application currently available is a portal for physicians that gives them access to various content channels, such as journals and drug databases,” says Monteith. The portal will serve more than 26,000 users, all of the doctors in Ontario, plus many of their staff. SSHA will also offer other portals of specific interest to the healthcare community. For example, a public health portal is under development to allow fast access to and exchange of critical information when a sudden health crisis, such as SARS, threatens public health.

Currently, SSHA is on the threshold of “throwing the switch” to broaden access to new communities of users and to add new applications, including a provincial directory which will serve as a healthcare “White Pages.”

In further extending the system and utilizing their network infrastructure investment, SSHA is phasing out its existing Centerx telephone system in favor of IP-based communications, a move that will reduce costs and allow a myriad of IP network-based features and applications. Initially focused on contact center operations, the Cisco IP Communications framework will help streamline the way in which SSHA provides support services to the broader health sector in Ontario.

As a world-class innovator in healthcare resource planning and technology provision, SSHA is enabling a compelling vision of future healthcare, in Canada and around the world.

“Common-use networks and infrastructure are the wave of the future. At SSHA we’re making the future a reality today. This innovative infrastructure will enhance healthcare for the benefit of all Ontarians and create a benchmark for e-Health across Canada,” says Monteith.

For More Information

To find out more about the Cisco Healthcare Solutions, go to: <http://www.cisco.com/go/healthcare>.

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