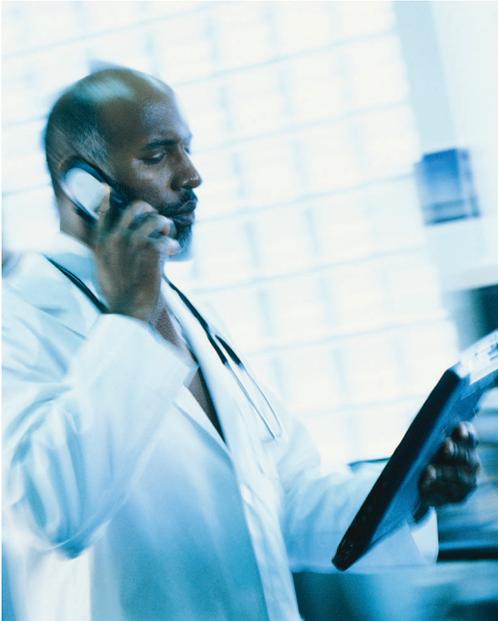


HEALTHCARE TRANSFORMATION SOLUTIONS



Hospital Background

As a leading hospital in the Chicago area, Northwestern Memorial Hospital operates 641 beds along the world famous "Magnificent Mile" in Chicago, Illinois. Northwestern Memorial is an academic medical center where caregivers come together with one goal in mind—to ensure patients have the best medical care and comfort possible. Northwestern Memorial improves the health of the communities it serves by delivering a broad range of services with sensitivity to the needs of its patients and their families. With its leadership, Northwestern Memorial has succeeded in being one of the "Most Wired" hospitals for four consecutive years and has leveraged technology innovation to enable better patient experiences.

Hospital Goals and Challenges

"The healthcare industry is transforming from a world of paper to electronic medical records. At Northwestern Memorial, we want to see information online and available for the physicians and clinicians," said Mike Carper, Director of Technology Services.

Northwestern Memorial's threefold vision includes providing the best possible patient experience, retaining caregivers and superior financial performance. To succeed, the hospital improved its business continuity, ensured regulatory compliance with government agencies, reduced threats to the hospital through pervasive security, and increased efficiencies by strategically deploying clinical applications such as electronic medical record (EMR) and computerized physician order entry (CPOE).

The challenge was to achieve a paperless system that was accessible to multiple stakeholders anytime, anywhere—affiliated physicians and specialists such as radiologists that could access and update patient information, medical transcriptionists who could transcribe physician narratives and orders, executives can stay fully-connected from home, and IT who could remotely troubleshoot and maintain the network. With these new service requirements, the increased threat to hospitals and the growing number of government regulations, Northwestern Memorial required a new approach to implementing security for the hospital.

"...information technology must play a central role in the redesign of the healthcare system if a substantial improvement in quality is to be achieved over the coming decade."

—Institute of Medicine, 2001

Technology as the Enabler

The first decision of Northwestern Memorial was to go with a single-vendor's infrastructure. Cisco was selected as the vendor of choice for a comprehensive, end-to-end network and security



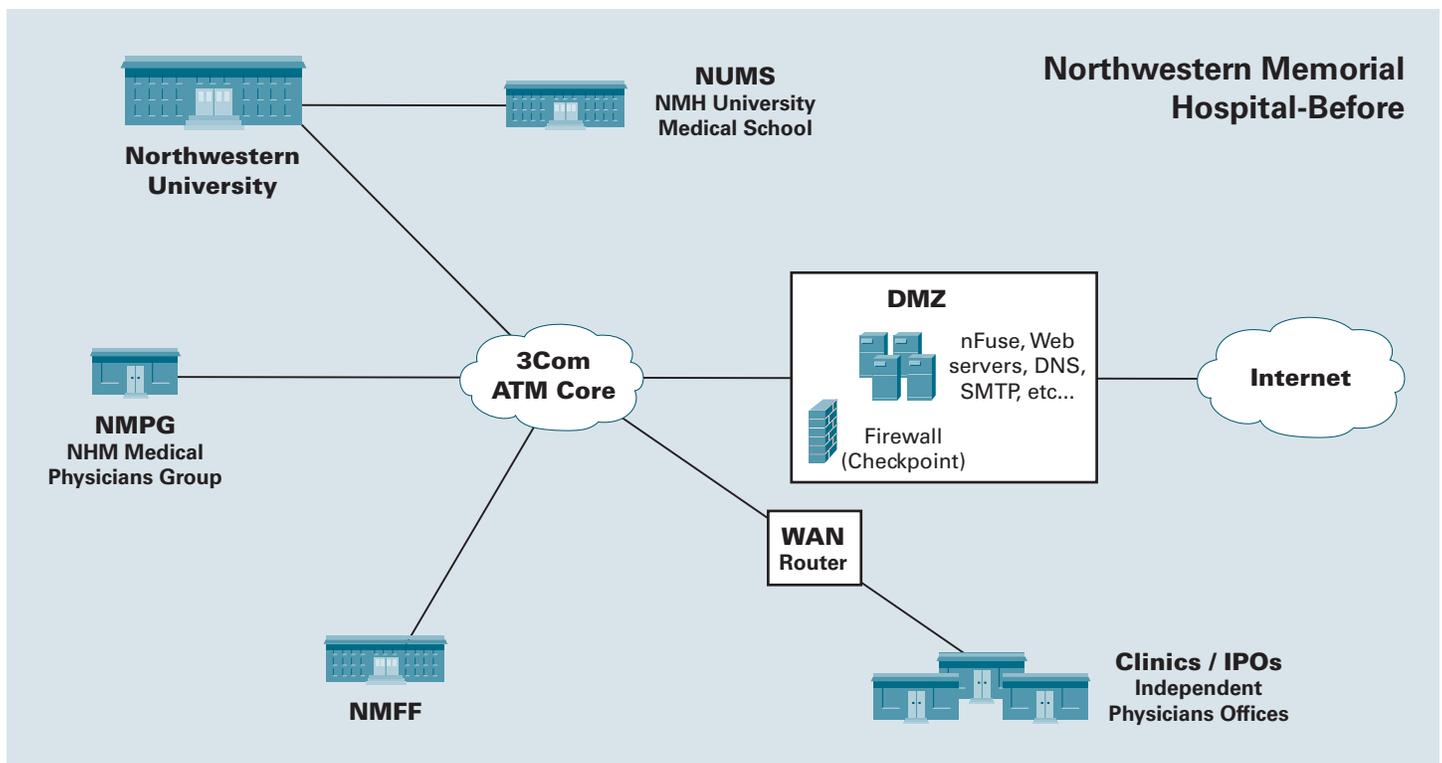
solution that would enable their applications and provide the added services and capabilities they required to improve their patients' experiences.

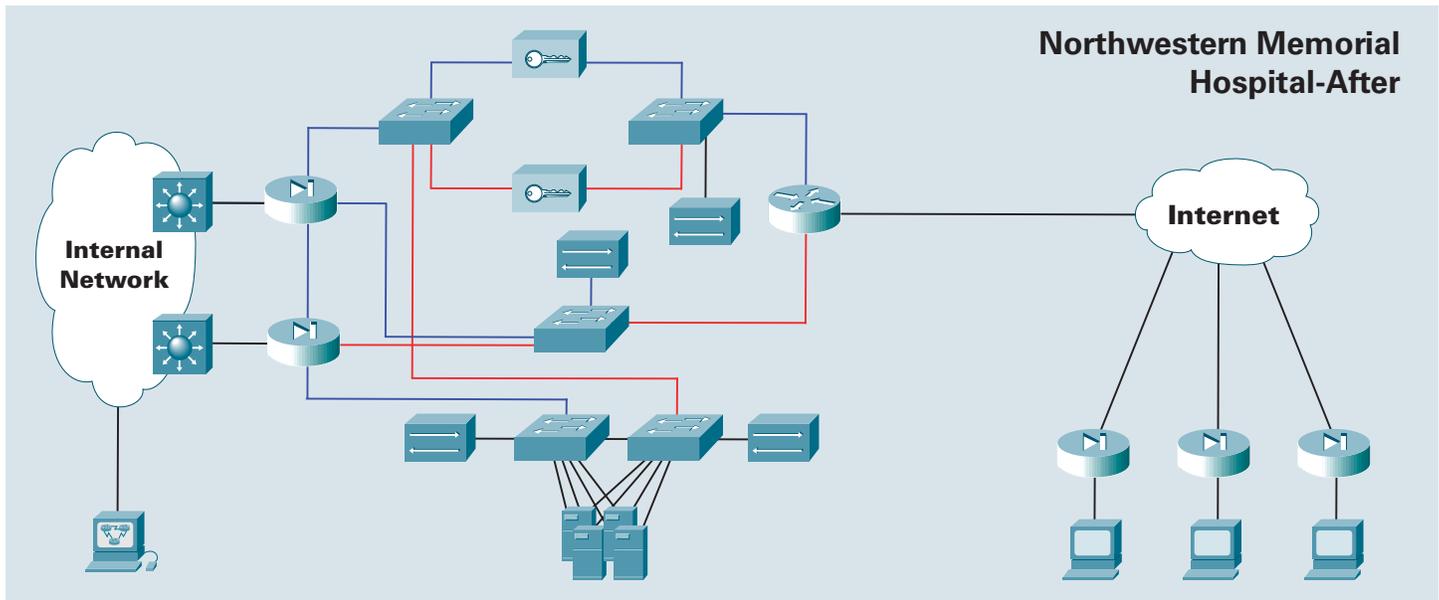
With Cisco Protect and Secure for Healthcare, Northwestern Memorial secured and improved the reliability of its network. "Since we had no VPN, we bought Cisco 3030s to provide secure access from home and increase caregivers' ability to access this information. We put in the Cisco Intrusion Detection System (IDS) concentrators at all network entrance points," says Rusty Sweet, Manager of Telecommunications and Network Services. The hospital improved its business continuity, having moved from ATM and even switches. "There were systems that relied on the network, like the picture archiving and communications system (PACS) and the radiology imaging system, which were out of business when the network was down. The net result was that physicians were not able to view radiology images-and that's bad," added Carper. "I don't think Northwestern Memorial would have moved so aggressively towards EMR if not for our ability to improve the reliability and availability of the network by installing Cisco gear."

"We are using wireless technology more than ever before. We added 1,500 wireless devices to this network in the last six months." said Sweet. "More and more, the medical community wants to be able to access information from multiple places including home, for example, if you're a physician", asserted Carper. "Because of HIPAA, we now encrypt the communication path to require authentication and validation especially in remote access applications. We make sure we protect the environment from intruders," he continued.

The Transformation

Prior to Cisco's involvement, Northwestern Memorial had an ATM network at the core and a spoke-and-hub architecture, providing access to indirect stakeholders and the university through basic authentication and one firewall. This left the core open to multiple points for threats such as Denial-of-Service (DoS), man-in-the-middle and sniffer attacks. Since there was no intrusion detection deployed, a virus or DoS attack would go unnoticed and quickly propagate until the network traffic was severely impacted. The lack of security management also made it even more difficult to pinpoint the source of the attack, leaving the hospital's critical applications in jeopardy.





"We had one single attached firewall—a single point of failure that was not redundant. We had a small overrun Internet connection. We had no intrusion detection system, no security framework built around our wireless solution and we didn't have a technology roadmap; it was impacting the hospital dramatically. Many doctors work from home during off-hours. Before, there was no VPN so connectivity wasn't secure, and we had lots of dial-up," shared Sweet. "We went from that existing firewall to dual PIX® Firewalls and now we have four big PIX Firewalls in place."

Redundancy was addressed by having PIX 525 Firewalls with stateful failover at the head-end of Northwestern Memorial's core network.

Healthcare Protect and Secure solutions helped Northwestern Memorial solve its regulatory compliance issues such as HIPAA. "Our reporting capabilities are greatly enhanced. Our ability to track intrusions or possible violations is excellent. We are far better off from where we were before—no question. When we had the big virus outbreak we were able to find out exactly which machines were affected; we were not able to do that before," said Sweet.

"As people move to relying upon technology it changes workflows and processes. It also changes the way people think about technology in the hospital," said Carper. "Since we moved to the Cisco network, we have exceeded our reliability goals for the network. Going forward, the

high availability of desktops, networks and back-end systems will have a dramatic impact on patient care."

The Results

"We've been able to expand the way we offer employees a working environment with VPN, the new firewalls and IDS. That's a different approach. Caregivers are able to work securely from home and we're able to offer them bandwidth that's large and inexpensive," said Sweet. "Telecommuting improves the patients' experience and increases the retention of top quality caregivers."

Northwestern Memorial has also been able to leverage its investment in the network by securely adding physical security solutions, such as HUGS, to the network. Using the network to manage physical security solutions allows the hospital administration to set parameters and guidelines that are managed by hospital policy instead of by an individual, providing greater security with less staff and management effort.

Northwestern Memorial reduced its costs, which impacts its financial statements. "We have a AA+ bond rating. Northwestern Memorial is one of the few hospitals that turns a profit and has cash in the bank. We want to maintain that position," added Carper.

Why Cisco

"We leveraged Cisco. It was very easy for us since we believed in Cisco and its SAFE architecture. We have great support from Cisco and its sales engineers. We have a great

"As projects and applications come into the environment, I no longer hear people say 'what if the network is down?' It was a way of life then—now it's like dial tone at home; you take for granted that the network is going to be up. That's a dramatic change and a great compliment to Cisco."

—Mike Carper
Director of Technology
Services

Cisco partner to work with too. We couldn't have done it without them," said Sweet.

Cisco Systems uniquely provides security solutions that improve patient care, enhance patient safety and reduce hospital threats. Cisco is the world's leading provider of comprehensive, end-to-end networking hardware, software and services simplifying management and reducing healthcare costs. Cisco products and services empower healthcare providers to build network infrastructures while providing the tools to allow hospitals and clinics to communicate with their patients, caregivers, healthcare partners and suppliers. Cisco is a trusted advisor and network partner you can count on...now, and in the future.

More Information

For more information, please contact your Cisco representative or reseller today, or visit us on the web at:

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