Health System Builds Technology Foundation to Deliver State-of-the-Art Care

Adena Health System uses Cisco switching, security, and wireless to deliver a rich suite of state-of-the-art clinical applications that bring vital information to the bedside, improve quality of care, and support advanced video and telemedicine services.

EXECUTIVE SUMMARY

Customer Name: Adena Health System

- Industry: Healthcare
- Location: Chillicothe, Ohio, United States
- Number of Employees: 2,000

Business Challenge:

- Support advanced wireless, video, and telemedicine applications
- Improve reliability and stability of the clinical network
- Protect confidential patient information across the environment

Network Solution:

Replace previous network infrastructure with Cisco switching. Deploy Cisco security and wireless solutions to support state-of-the-art clinical applications and information systems.

Business Results:

- New network delivers vital applications wherever and whenever clinicians need them
- Emergency Department patient turnaround times reduced by as much as two hours
- IT team can manage the entire environment centrally and efficiently
- Telemedicine application brings remote specialist expertise to infant patients

Business Challenge

Imagine you are the chief information officer (CIO) of a major regional hospital in your first week on the job. You have barely finished unpacking your office when all of a sudden, the entire network goes down. All applications—health information systems, e-mail, clinical applications—are offline. And the chief hospital executives who hired you are standing in your office asking what you plan to do about it. The scenario is every CIO's worst nightmare, but it was all too real for Marcus Bost, CIO of Adena Health System.

Adena Health System is a nonprofit health system encompassing the Adena Regional Medical Center and several smaller clinics. Located in Chillicothe, Ohio, the medical center serves as the primary hospital for 10 rural counties in Southern Ohio. The hospital had relied on a network composed of equipment from multiple vendors for many years, and the infrastructure had become extremely unstable. Bost had already planned on revamping the network, but in the wake of the outage, the project quickly became his top priority. Rather than viewing the upgrade as a challenge, however, Bost saw it as an opportunity to transform the way health care was delivered at Adena Regional Medical Center.

Bost envisioned a state-of-the-art hospital employing the latest clinical information technologies, including wireless care at the bedside, electronic medical records and clinical systems that could be shared instantly among providers throughout the region. He also believed that Adena could lead

the way in using telemedicine—video conferencing technology that connects patients with remote doctors—to improve the lives of patients. The technology could prove particularly valuable to Adena's rural, southern-Ohio patient population, who often had to travel great distances to access the specialists and clinical capabilities available at larger urban medical centers.

To make Bost's vision a reality, Adena needed a complete network overhaul. The medical center needed a robust network infrastructure that could not only deliver basic clinical systems reliably, but could also support high-bandwidth, delay-sensitive applications such as video-conferencing. It needed a wireless infrastructure that was highly manageable and secure. Since the network would deliver confidential patient information, it needed the strongest security. Bost also wanted longevity. Recognizing that the network overhaul was a unique opportunity, he wanted to make sure that any solution he deployed could provide the bandwidth, scalability, and flexibility to support the health system for the next several years.

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>
> **—Marcus Bost, Chief Information Officer, Adena Health System**

Network Solution

After considering several options, Bost chose Cisco to support the entire network overhaul.

"We wanted a single-vendor solution, and Cisco emerged as the clear winner," says Bost. "We know when we go with a Cisco product, it's going to work with every other Cisco product in our environment. We can turn up advanced applications, deploy wireless on top of our wired network, and there is no guesswork about how we'll be able to make everything work together and manage it. With Cisco, everything just works."

To provide the foundation of the new Cisco Medical Grade network, Adena deployed Cisco[®] Catalyst[®] 6500 Series switches in the core, the distribution, and in every wiring closet in the hospital, with Cisco Catalyst 4500 Series and Cisco Catalyst 3750 Series switches at the remote sites. While some organizations use the Cisco Catalyst 6500 Series solely as a core switch, Bost believed that by deploying these platforms throughout the hospital network, Adena would have ample bandwidth and scalability to support future clinical applications. The Cisco Catalyst switches provide industry-leading reliability and Gigabit connectivity to the desktop, as well as supporting the integration of security, management, and wireless modules.

Securing the Solution

To protect the clinical network, Adena integrates Firewall Services Modules (FWSM) into the Cisco Catalyst 6500 Series platforms. The modules provide exceptionally fast firewall data rates, as well as virtual private network (VPN) connectivity between the hospital and the smaller off-site clinics, protecting patient information.

At the network perimeter, Adena uses Cisco ASA 5500 Series appliances to provide both advanced firewall and intrusion prevention system (IPS) services. The appliances communicate with the Cisco switches and wireless access points throughout the environment to provide intelligent, adaptive network defense against malware and other threats. And, because the appliances combine firewall and IPS services in a single platform, they provide a more manageable, cost-effective solution.

Going Wireless

With a robust network foundation deployed, Bost turned to the next phase in his vision: delivering clinical information throughout the hospital wirelessly. Adena deployed Cisco Unified Wireless Network with the Cisco Wireless Control System (WCS) for centralized management, Cisco Aironet® 1240 Series and 1130 Series wireless access points and Wireless Services Modules (WiSM) in the Cisco Catalyst 6500 Series to manage the entire wireless infrastructure. Wireless connectivity in the Emergency Department and operating room allowed staff to use wireless-enabled mobile carts to perform triage and patient registration at the bedside.

"At most hospitals, after signing in to the Emergency Department, patients go to a waiting room," says Bost. "At our medical center, we take you straight to a bed and begin caring for you immediately."

"The Cisco Wireless Control System lets me make security and other configurations across the environment very easily, through a centralized interface," says Brian Young, senior systems and security analyst for Adena Health System. "Getting the access points up and running was very easy compared to other vendors I've worked with."

Next-Generation Telemedicine

One of the most exciting projects Adena was able to launch as part of the network overhaul was an innovative telemedicine program. While the medical center provided outstanding care for mothers and newborns, it had very limited access to physicians specializing in neonatal critical care. For that reason, Adena doctors typically had little choice but to transfer any newborn who might need critical care to Nationwide Children's Hospital, 70 miles north in Columbus. In fact, Adena typically transferred more newborns to Children's Hospital than any other provider outside Columbus. The transfers could place significant strain on families and patients.

With a robust network foundation in place, Adena was able to connect its Neonatal Department with the Nationwide Children's Hospital neonatal intensive care unit via a high-definition video-conferencing system. The solution allows specialists in Columbus to evaluate newborns with their own eyes, share test results and imaging films, and consult with local Adena doctors as if they were standing in the same room.

Business Results

Today, the Adena Regional Medical Center network is more robust and reliable than ever before. The network foundation supports a rich suite of state-of-the-art clinical applications, but even more important, it provides the services clinicians need, where and when they need them.

"At one time, our users couldn't rely on the network to deliver on simply sharing files and serving them up," says Bost. "They wouldn't even save their files to a network directory because they couldn't trust it. That never happens anymore. They know that the network is there when they need it."

"The performance and stability of our Cisco switching infrastructure is extraordinary," adds Young. "The Cisco Catalyst 6500s don't go down. The integration of multiple modules and services into a single chassis is also very beneficial from a cost perspective. And the ability to use the same management interface across all of the switches makes administrating the network so much easier."

In the Emergency Department, the Cisco Unified Wireless Network brings a wealth of clinical information and decision support tools to the bedside. Clinicians can view diagnostic films, look up lab results, and share information with patients without having to constantly walk back and forth to a nursing station. The bedside triage and registration processes have also dramatically improved department workflow.

"We've been able to significantly increase our productivity and throughput in the Emergency Department," says Bost. "In the past, our average turnaround time was three to four hours. With the new systems, we've been able to get the average emergency stay to below 120 minutes. Simply being able to serve more patients with the same staff and facilities has generated a $4 million annual return on investment. More important, our patients get the care they need more quickly. Our patient satisfaction survey scores have gone way up."

Delivering Expert Neonatal Care, Virtually

The ability to support high-definition telemedicine with the new Cisco network is already having a profound effect on Adena's newborn patients and their families.

"Telemedicine dramatically improves the care we can provide for our infant patients," says John Fortney, MD, medical director for Adena Health System. "If we're looking for help with a diagnosis, someone from Children's Hospital, whether a neonatologist or a sub-specialist, such as a pediatric cardiologist, can see the patient and speak to the attending physician in real time."

With these expert evaluations happening right at Adena, doctors in Chillicothe can make more accurate diagnoses and avoid having to place undue stress on newborns and their families.

"In the past, if there was any uncertainty about a patient, the baby would be transported to Columbus," says Jackie Stansberry, director of Women's and Children's Center for Adena. "Now, with digital test results and clear, live views of the baby, it's easier for specialists to allow the patient to stay here. The number of newborns we transferred to Children's Hospital in 2007 was half of what it was in 2006, so we can really see it making a difference."

Next Steps

In the coming months, Adena plans to continue expanding its Cisco Unified wireless network and the clinical information systems it supports to all floors of the hospital, as well as to smaller clinics and remote facilities. The health system is also in the process of constructing a major new educational campus near the medical center, which will support a four-year nursing school in collaboration with Wright State University in Dayton, Ohio. The facility will include virtual classrooms, in which physicians in Dayton will use a telemedicine application and the Cisco network backbone to teach remote students virtually. The facility also will support video recording and broadcasting over the Cisco IP network.

"We will be deploying a considerable amount of audio and video services over our network in the next 12 to 14 months, and we are confident that the Cisco infrastructure will support it," says Young. "We could double or even quadruple our bandwidth in some locations before even having to consider upgrading our equipment."

PRODUCT LIST

Routing and Switching
- Cisco Catalyst 6500 Series Switch
- Cisco Catalyst 4500 Series Switch
- Cisco Catalyst 3750 Series Switch

Security and VPN
- Cisco Firewall Services Module for Cisco Catalyst 6500 Series
- Cisco ASA 5500 Series IPS Edition

Cisco Unified Wireless Network
- Cisco Aironet 1240 Series Access Points
- Cisco Aironet 1130 Series Access Points
- Cisco Wireless Services Module for Cisco Catalyst 6500 Series
- Cisco Wireless Control System

For More Information

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