

Network Helps Take Healthcare System into Bold Future

Sanford Health launches ambitious initiatives for expansion and integration of healthcare services with Cisco advanced network.

EXECUTIVE SUMMARY
<p>SANFORD HEALTH</p> <ul style="list-style-type: none"> • Industry: Healthcare • Location: Sioux Falls, South Dakota • Number of Employees: 12,000
<p>BUSINESS CHALLENGE</p> <ul style="list-style-type: none"> • Substantial philanthropic donation leads to a rapid expansion of hospital network and creates a need for tight links with affiliated centers • Adoption of digital imaging, electronic patient records, and telemedicine relies on faster, higher capacity, and more reliable network • Long-range vision for transforming healthcare delivery and services requires future-proof technology investment
<p>NETWORK SOLUTION</p> <ul style="list-style-type: none"> • Cisco stackable switches in the wiring closet provide advanced functionality, improved manageability, and higher performance to support PACs, EMR, and other applications • Cisco campus blueprint helps network staff confidently and quickly create the optimum design for infrastructure upgrade • Cisco modular technology helps ensure investment protection as IT moves toward Unified Communications, wireless IP phones, digital media-based patient signage, and more • Power over Ethernet in switches makes aggressive expansion schedule easier by allowing new wireless access points and, in the future, IP phone system to be installed anywhere
<p>BUSINESS RESULTS</p> <ul style="list-style-type: none"> • Reliable network helps ensure around-the-clock healthcare delivery • Added network capacity supports new facilities and services and initiatives such as telemedicine • Simplified infrastructure makes it easier for small network staff to support network maintenance and focus on demands associated with growth in facilities, services, and programs

Business Challenge

A century-old South-Dakota-based healthcare system is moving to the forefront of healthcare, thanks to an extraordinary gift of US\$400 million from South Dakota businessman and philanthropist Denny Sanford. This is the largest donation to a healthcare organization in history.

Sanford Health serves nearly 100 communities, covering roughly 80,000 square miles across South Dakota, Iowa, Minnesota, and Nebraska. The system serves an average of 30,000 in-patient and one million outpatient visits annually. Sanford Health is the largest healthcare system between the Mayo Clinic in Minneapolis and Denver.

The transformational gift, as Sanford Health describes it, has spawned an extraordinary vision for new healthcare initiatives, including developing a world-class clinical research and education program and the creation of a multifaceted initiative focused on the health and well-being of children. The organization has already broken ground for Sanford Children’s Hospital (designed in the shape of a castle), which will be the region’s first dedicated children’s hospital and the eventual hub for a network of children’s care clinics around the globe. The children’s hospital will be one of 20 facilities built on the Sanford Healthcare campus of the future, yet another transformational vision of how facilities and services will be delivered to the community.

Arlyn Broekhuis, Sanford vice president and CIO, knew that this vision for the future of healthcare would require an equally forward-looking technology foundation to enable continual advances. Scott Sylliaasen, network security manager, was brought on board to oversee a complete upgrade of the network infrastructure. “Sanford is creating one of the few truly integrated, comprehensive health systems in the nation,” says Sylliaasen. “We needed a robust, unifying network that would support our picture archiving and communication system (PACS) and electronic medical record (EMR) applications, as well as telemedicine and unified communications in the future.”

Sanford Children's Hospital



Network Solution

The focus of the first major upgrade project was the Healthcare Campus of the Future in Sioux Falls. The campus encompasses 14 buildings, including the 500-bed Sanford University of South Dakota (USD) Medical Center, which is the largest tertiary hospital in South Dakota, a recently completed Surgical Tower, and the Sanford Children's Hospital currently under construction.

Initially, the network team planned a two-tier core to access layer design. Instead, they decided to go with a three-tier topology recommended by Cisco for a campus implementation. "We made some modifications to the design, but having the Cisco blueprint gave us an excellent starting point, saving us time and increasing our confidence in the end result," Sylliaasen says.

Each building on the campus has between six and eight wiring closets that aggregate and switch all of the voice, data, and video traffic within the building and across the campus. When Sylliaasen evaluated the existing equipment, he knew immediately that the access layer was woefully deficient in supporting current demands, much less providing a future-proof architecture for Sanford's expansive vision.

"The reality is that IT doesn't always get the most environmentally sound closets," says Sylliaasen. "Hospital closets are usually small and have poor air circulation and cooling. Most of the switches were also unmanaged, which made it extremely labor-intensive for my small staff to service a highly distributed network. Between the failures and troubleshooting issues, the old network strained our ability to focus on new initiatives."

From an architectural roadmap standpoint, the switches also lacked several important capabilities that would provide a growth path for the future. "We wanted access layer switches with multicasting to support video over the network, and Power over Ethernet [PoE] to support the deployment of IP phones anywhere on campus. Above all, we needed increased bandwidth. It was essential that the network provide gigabit Ethernet in order to enable very large transfers of data and images for research, patient records, telemedicine, and other applications," says Sylliaasen. "We **needed** 10 gigabit uplinks from the access layer."

Sylliaasen had prior experience using Cisco® Catalyst® 3750s with StackWise technology in the wiring closet. “I have always been impressed with the fact that Cisco is continually improving their technology. They do an outstanding job of backwards and forwards compatibility, so I can feel confident about my investment.”

When the Cisco Catalyst 3750-Es came out, Sylliaasen saw it as just such an evolution and a smart choice for Sanford Health. “With the 3750-Es, Cisco increased the interconnection speed in the switch stack from 32 to 64 Gbps. And the StackWise Plus technology lets us manage nine switches via one IP address, which makes it possible to monitor and manage all of these campus switches with much greater ease. The really powerful factor for us was that the 3750-Es provide an outstanding migration path to 10 Gbps in the access layers, which will give us a great future.”

Currently, the 3750-Es provide PoE to the Cisco Aironet® access points that make the Healthcare Campus of the Future completely wireless. “The 3750-Es give us 15.4 watts of PoE on each of the 48 ports. With a simple software update, we will be able to move to the draft IEEE 802.11n standard and get 20 watts of power to support the newer Cisco AP1250 wireless access points,” says Sylliaasen. “When the time comes, the PoE switches will also give us the ability to deploy IP phones anywhere we need across the campus.”

“I can envision having this access layer switch for a long time, supporting world-class care for generations to come.”

—Scott Sylliaasen, Network Security Manager, Sanford Health

Business Results

As the network upgrade proceeds and new buildings continue to open, the network team has benefited from the ease of reconfiguring new wiring closets with the 3750-Es. “I have three network engineers on staff who are responsible for supporting the WAN, the LAN, Internet, firewalls, and the wireless network. It is a big plus to be able to provision the wiring closets so quickly, especially considering that we are implementing some pretty advanced services, like QoS and multicasting,” says Sylliaasen.

One of the best testaments to the improved reliability of the new network over the old one is that once the 3750-Es are installed, the team virtually forgets about them. “Our east patient building has had nothing but good results. The only downtime we had was when we took out the old equipment and installed the new switches. The Cisco gear just runs. That has given everyone a higher level of confidence in the network, compared to what we were experiencing before,” says Sylliaasen. “For my staff, it means we can stay focused on deployment of new equipment to keep up with all of the new buildings and programs. We haven’t had to add a single engineer to support this tremendous growth.”

PoE has also proven to be a feature with multiple benefits. “In healthcare, wireless is the way of the future. With the continual demand of a new wing here, a new hallway there, it’s nice to know that I can plug in a Cisco access point and deliver power to it without worrying about installing power injectors and other hardware in the ceilings,” says Sylliaasen. “Wireless and PoE also give us the foundation to consider future initiatives like RF-based inventory tracking for medical equipment.

“When I heard about the Cisco 3750-Es, I was very excited,” says Sylliaasen. “The 10 Gbps uplinks will benefit us tremendously and give us a better longevity to bring gigabit connectivity to the desktop, and eventually to the distribution layer. We have cleaned up our wiring closets, simplified deployment and day-to-day management, while also gaining more advanced features for current and future applications. Seeing all the features that are coming with the 3750-Es, I know we made the right choice. I can envision having this access layer switch for a long time, supporting world-class care for generations to come.”

PRODUCT LIST

Routing and Switching

- Routing and Switching
- Cisco Catalyst 3750-E Series Switch
- Cisco Catalyst 6500 Series Switch
- Cisco 2811 Integrated Services Router
- Cisco 3845 Integrated Services Router

Wireless

- Cisco Aironet 1250 Series Access Points

Next Steps

“The Cisco network provides the foundation to implement secure converged applications,” says Sylliaasen. “The next step we’ll probably be implementing is 802.11 wireless IP phones. Then we will look at expanding our telemedicine capabilities, now that we have a network that can easily support video. We are envisioning a fully routed access layer, which will give us greater resilience and make troubleshooting even easier.

I can even anticipate that a fully routed access layer will strengthen security, because we will be able to isolate problems locally to prevent the spread of any type of virus.”

For More Information

For more information about Cisco Catalyst Switches, go to <http://www.cisco.com/go/catalyst>.



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