Customer Success Story

Cisco Optical Network Helps Banner Health Provide State-of-the-Art Clinical Care

Executive Summary

Customer Name

Banner Health

Industry

Healthcare

Business Challenge

- Increase bandwidth to support growing array of clinical applications and services
- Lay a foundation that can support state-of-the-art wireless, voice-over-IP (VoIP), and network-based clinical applications today, as well as in the future
- Ensure maximum availability and resiliency, as well as strong security across the network

Network Solution

- Highly available Cisco metro optical network, with Cisco LAN and wireless solutions

Business Value

- Provides bandwidth to support a full suite of modern clinical applications, imaging solutions, voice, and wireless systems that enhance patient care
- Allows for much more manageable, secure, and resilient network operations
- Provides a robust, flexible foundation for delivering future services and applications

Banner Health uses a high-speed, highly available Cisco® optical network to connect eight major sites in Arizona and power a variety of clinical applications and services that enhance patient care.

Business Challenge

Banner Health is one of the largest nonprofit healthcare networks in the United States, with hospitals in Arizona, Nevada, Nebraska, Wyoming, California, Colorado, and Alaska. The organization operates eight major hospitals in Arizona alone and is the second-largest private employer in the state.

As a national healthcare leader, Banner Health strives to equip clinicians with the latest tools to provide exceptional patient care. By 2004, the Banner Health hospitals in Arizona were beginning to adopt picture archiving and communications systems (PACS), wireless networking, VoIP, video-based telemedicine, and new electronic medical record (EMR) systems. These solutions allowed clinicians to more easily share real-time patient data (including high-resolution images), access comprehensive information and applications at the bedside, and deliver care more efficiently. But to keep network costs under control, Banner Health's IT leaders had to find a way to deliver these applications efficiently.

"We're a not-for-profit organization," says James Pflugfelder, director, Network Planning & Integration for Banner Health. "So every extra dollar we can save is a dollar we can use in other areas to improve patient care."

Instead of deploying separate solutions at each hospital, the IT team wanted to build a single, centralized system that could deliver voice, video, and data services to any facility on the network. In addition to the cost advantages, the IT team believed that by centralizing these processes, they could create a more resilient network infrastructure, and one that would allow them to more easily add new services in the future. But there was one problem: Banner Health's existing SONET DS-3 metro network could not provide the bandwidth to support this strategy.

"We're very focused on providing our doctors and nurses with the tools they need," says Pflugfelder. "If we can't give them the bandwidth to support those tools, then they're forced to live with reduced functionality in caring for their patients."

Pflugfelder and the Banner Health IT team decided to upgrade the LANs at all eight facilities and overhaul the metro network.

"We knew that all of these applications were coming at us, and they were all going to gobble up bandwidth," says Pflugfelder. "It just made no sense to shortchange the solution in any way."

“We’ve been able to adopt state-of-the-art technology and even step into the carrier-class world to provide the functionality we need. What we’ve done here is unprecedented. We’ve moved into an area of bandwidth and functionality that most healthcare providers have yet to achieve.”
– James Pflugfelder, Director, Network Planning & Integration for Banner Health

Network Solution

After exploring several options, the Banner Health team decided to replace the DS-3 network with a 160-mile metro optical ring. By owning and provisioning a dedicated dense wavelength-division multiplexing (DWDM) network, Pflugfelder believed the organization could implement a long-lasting, versatile foundation for virtually any future application.

Banner Health worked with local fiber provider SRP and longtime partner SBC to provide the planning, design, installation, and ongoing monitoring of the optical network. For the optical technology itself, Banner Health chose Cisco ONS 15454 multiservice provisioning platforms (MSPPs).

At each facility, dual Cisco ONS 15454 MSPPs aggregate voice, video, and data services, and enable Banner Health administrators to easily provision high-bandwidth services across the network. With Cisco DWDM provisioning tools, the platforms combine carrier-class optical network performance with the capability and manageability of traditional IP networking solutions. The organization also deployed dual Cisco Catalyst® 6500 Series switches at each facility to provide redundant, high-performance, high-port-density Gigabit Ethernet aggregation throughout the LANs.

Supporting an environment in which an outage can literally mean the difference between life and death, network availability was Banner Health’s chief design consideration. So the solution employs fully redundant chassis, power supplies, and management engines to protect the network from failures in any node, line card, or segment of fiber, and achieve true “five-nines” availability.

“We had great teamwork with Cisco and SBC to help us build a network that had all the high availability we required of it, as well as more than 150 times the bandwidth we had previously,” says Pflugfelder.

Building the Health System of the Future

As part of the upgrade, Banner Health also expanded its wireless footprint in Arizona, deploying Cisco Aironet® wireless access points to support a variety of applications. Beginning with 40 access points statewide in 2004, Pflugfelder expects the organization to have more than 600 installed by end of 2005.

The IT team outfitted two Banner Health facilities with full wireless coverage, allowing clinicians to access patient records, e-radiology systems, and a computerized physician order entry (CPOE) system from wireless tablets at the point of care. Instead of asking Emergency patients to wait in line at a front desk, hospital staff can register patients at the bedside using wireless laptops. In addition, several hospitals were outfitted with a wireless voice solution that allows clinicians to immediately reach a nurse or physician just by speaking a name out loud.

All of these wireless and VoIP applications are securely delivered through the Cisco wired and wireless LANs, and centrally managed and supported over the Cisco optical metro network. But for the Banner Health IT team, the major advantage of the centralized architecture is that whenever a pilot proves successful at one facility, it can be rolled out to other facilities quickly and relatively inexpensively. This versatility, combined with the huge increase in available bandwidth, has opened doors to solutions that previously would have been unthinkable.

“When we rolled out our new Banner Estrella facility, our Security people asked us about having 100 security cameras there send live video streams back to our corporate data center, so they could avoid the need to monitor the cameras onsite,” says Pflugfelder. “We were looking at a total of 100 separate one-megabit-per-second video streams, day and night, 24-7, and we were able to say, ‘Sure, go ahead.’”

Banner Health ultimately decided not to move forward with the full remote monitoring solution, but still deployed a network-based video security system. Security personnel today can remotely control and view any Banner Estrella security camera from any facility on the optical network.

Business Value

With the new Cisco optical network and Cisco LANs, Banner Health now has the bandwidth, resiliency, and network performance to take the next step in state-of-the-art patient care. The organization can deploy virtually any application or service that will improve clinicians' abilities to care for patients. The centralized architecture of the solution also allows the Banner IT team to provision services extremely efficiently and cost-effectively. Which, in turn, means that Banner IT developers can continue innovating and adding new services and capability for caregivers.

"Instead of having to roll out eight different implementations for our facilities, we can roll out just one," says Pflugfelder. "That gives us all of those additional funds and more time to innovate in other areas. By building a much simpler, more manageable system, we can give caregivers much more access to new applications and solutions."

Most importantly, thanks to the resilient Cisco solutions and the expert implementation by SBC, the solution is extremely reliable. Even when sections of the optical ring have been taken down for fiber maintenance, the network has never gone down.

"We were not live for more than a few days when, on a rainy morning at 2 a.m., a Buick slammed into a telephone pole in the Northwest Valley, crushing the fiber," says Pflugfelder. "We took less then a 1-second hit during that impact. But the following day, the link was out for 12 hours while the damage was repaired. Due to the metro ring resilience, nobody even knew it was happening."

Ultimately, Pflugfelder believes that the Banner Health facilities in Arizona are now better positioned than ever before to provide exceptional patient care, and support any tools clinicians may need far into the future.

"We've been able to adopt state-of-the-art technology and even step into the carrier-class world to provide the functionality we need," says Pflugfelder. "What we've done here is unprecedented. We've moved into an area of bandwidth and functionality that most healthcare providers have yet to achieve."

Next Steps

Today, Banner Health is in the planning stages for adding a secondary data center to the ring as part of a business continuance and disaster recover strategy. The solution will provide synchronous and asynchronous data mirroring of all network processes across the health system, with full load sharing and full recovery within seconds after a catastrophic failure. As part of the plan, Banner Health is quadrupling the bandwidth between the two data centers, which will ultimately be connected by two 20-Gigabit Ethernet channels.

Banner Health also is deploying new telemedicine applications throughout the healthcare system that will use real-time voice and video to allow physicians to consult and collaborate on procedures remotely. The metro network will easily support the required 30-Mbps streaming video between sites.

"Now, whenever someone asks for something that will place new demands on our infrastructure, our answer is yes," says Pflugfelder. "That's the biggest benefit. It's empowered us to say yes."

For More Information

Cisco optical solutions have already helped enterprises and service providers around the world reduce costs, simplify service provisioning, and support a wide range of new applications. To find out how Cisco Systems® can help your organization, contact your local account representative, or visit http://www.cisco.com/go/optical.

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the **Cisco Website at www.cisco.com/go/offices.**

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica
Croatia • Cyprus • Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR
Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico
The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia
Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan
Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Pa/LW8875 07/05

Printed in USA