

## Health Care System Speeds Delivery of Applications to Remote Facilities

Cisco WAAS upgrades bandwidth and eliminates high recurring WAN circuit expenses.

| EXECUTIVE SUMMARY   |
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| <p><b>BANNER HEALTH</b></p> <ul style="list-style-type: none"> <li>• Industry: Healthcare</li> <li>• Location: Phoenix, Arizona</li> <li>• Number of Employees: 27,000</li> </ul>   |
| <p><b>BUSINESS CHALLENGE</b></p> <ul style="list-style-type: none"> <li>• Difficult to staff specialized IT talents at each remote hospital facility</li> <li>• High WAN bandwidth cost</li> <li>• Poor application performance across the WAN to remote hospital facilities</li> </ul>   |
| <p><b>NETWORK SOLUTION</b></p> <ul style="list-style-type: none"> <li>• Upgrade WAN to lower costs and increase application performance</li> </ul>  |
| <p><b>BUSINESS RESULTS</b></p> <ul style="list-style-type: none"> <li>• WAN bandwidth upgrade avoidance of US\$8000 per month</li> <li>• Response time improvement of three times for PACS alone and overall LAN-like application performance for remote hospitals</li> <li>• Bandwidth savings of 60 percent for all hospital applications</li> <li>• Achieved return on investment in 1.3 months</li> </ul> |

### Business Challenge

Banner Health is a nonprofit hospital network committed to its mission to make a difference in people’s lives through excellent patient care. Headquartered in Phoenix, Arizona, Banner Health has 20 hospitals and other medical facilities that offer an array of services including inpatient/outpatient hospital care, home and hospice care, nursing registries, surgery centers, laboratories, and rehabilitation centers. Banner Health’s extensive medical centers offer a comprehensive foundation of clinical programs and an equally impressive offering of highly specialized programs.

Banner Health’s network of hospitals are geographically spread throughout the Western region of the United States, with large hospitals in metropolitan areas and smaller hospitals in more remote, rural areas. Some facilities are thousands of

miles away from Banner Health’s headquarters in Arizona. Other than file and print, which is run locally at the remote sites, most applications are delivered centrally to the network of hospitals from Banner Health headquarters that has fiber running between all their facilities. These applications include:

- McKesson application suite for nursing
- MTS DELFT for PACS
- Cerner suite of clinical applications
- Misys Laboratory Information System®
- MEDICS pharmacy and Siemens Med Series 4 for Health Information Systems (HIS).
- Lawson for materials and people management
- Kronos for workforce management

The remote sites have MTS DELFT Picture Archival and Communications System (PACS) installed that store medical image files locally and also send them to the main facility. Since these medical image files can be quite large, the Banner Health IT team must help ensure that they are acquired correctly via the Digital Imaging and Communications in Medicine (DICOM) standard and then archived consistently using MTS DELFT. Because IT resources at the remote sites are very limited

in terms of head count and depth of expertise, Banner began exploring cost-effective ways to centrally manage and deliver medical images and critical applications to promote high physician productivity and good user experience.

**“I was pleasantly surprised with the results of the Cisco WAAS. We are seeing an average of 60 percent capacity improvement for our WAN bandwidth, which includes all applications and even the traffic that is normally impossible to optimize further. As an added bonus, once the Cisco appliances were easily configured, we did not have to watch or ‘baby-sit’ the system.”**

—Steve Rains, System Director, Information Technology, Banner Health Western Region

The high recurring expenses of Wide Area Network (WAN) circuits also motivated Banner to find ways to improve WAN asset utilization and avoid further upgrade. T1 lines that Banner Health utilizes typically cost a few hundred dollars per month. But in certain remote sites, T1s were costing the company well over US\$8000 per month.

### Network Solution

Banner Health invited WAN solutions from a few vendors including Cisco<sup>®</sup>, and began testing at a hospital that was fairly close to their Greeley, Colorado facility, where they initially tested and ran applications similar to what would be running at some of the most remote sites. Applications utilized at the test site included the McKesson application suite for nursing, Cerner suite of clinical applications, Misys Laboratory System software, and MEDICS pharmacy and Siemens Med Series 4 for Health Information Systems (HIS).

“Our test setting consisted of a wide range of applications representing our current environment,” says Rains. “We are moving to a more homogenized environment over time including Cerner for electronic medical records, which will provide all the clinical information. We will maintain the Siemens Med Series 4 for the medial discharge; our business systems are pretty much all Lawson, which are the materials management, people resources, etc. and Kronos for employee time and attendance”

“We worked with Cisco representatives to quickly get the traffic redirection situation working smoothly and found that there really was not a lot of tweaking that we had to do on the WAAS software; it ran pretty well right out of the box,” says Rains. “We added applications such as DICOM and some specific TCP ports so we could watch and optimize traffic, and found that it all ran smoothly.”

Banner Health selected Cisco 2811 Integrated Services Routers (ISR) with the Cisco WAE 512 appliances for remote sites, a Cisco 7200 Series Router, and WAE 7326 appliances for the central site to accelerate application and file performance, and to minimize WAN bandwidth usage. According to Rains, Cisco WAAS achieved superior performance results over other vendor offerings by reducing latency and bandwidth consumption, improving throughput, and providing transparent out of path network integration using WCCP v2 eliminating single point of failure, and centralized management. Cisco WAAS has been deployed at five Banner Health sites to date, with

approximately ten more site deployments planned in the near future.

“Before moving to the Cisco WAAS, our bandwidth would spike to 100 percent during the day, and since integrating the WAAS, we have decreased that to 40 percent,” says Rains. “The Cisco WAE 512 appliances have been running consistently and error free. The centralized management coupled with the ability to characterize the traffic according to days, months, and traffic type, and see the effectiveness of capacity per application has been a real plus for us. And I am personally impressed that we have not had a single incidence of failure. Quite frankly I was a little reticent when we first implemented the WAAS because of the remoteness of so many of our sites.”

### **Business Results**

Rains credits the Cisco WAAS as having given Banner Health’s WAN three times better response time and approximately 60 percent better capacity for all applications including the already compressed PACS images.

“The quickest payback we have seen so far was about in 1.3 months in our more remote facilities, and the farthest out payback has been just under six months,” says Rains. “The cost really varies depending on the location and what capacity can be obtained at a specific location. The biggest payout we have seen so far was for the facility where we had previously paid more than US\$8000 a month for the T1s. We were able to avoid another US\$8000 per month upgrade altogether because of Cisco WAAS.”

According to Rains, Banner Health has seen an increase in usable bandwidth and capacity, and a great improvement in overall traffic. Traffic for Banner Health includes medical images, file and print, Web, and anything going over the WAN. It also includes everyday hospital transactions including employee timecards, materials management, order placement, and a myriad of business applications that are needed to run the hospitals network.

“I was pleasantly surprised with the results of the Cisco WAAS,” says Rains. “We are seeing an average effective capacity in our circuit of 1.6 times, which includes all applications and even the traffic that is normally impossible to optimize further. As an added bonus, once the Cisco appliances were configured, we did not have to watch or ‘baby-sit’ the system.”

Lowered costs for Telco services and reduced bandwidth are just a few of the benefits that Banner Health has begun to experience since implementing the Cisco WAAS.

“One of the best features that we have experienced so far is the ability to manage all of the Cisco WAAS appliances from a single location and to be able to add a site by simply using a template,” says Rains. “The ability to characterize the traffic and graphs with a quick look and click of a mouse is priceless. It has also been great to be able to see the effective capacity per application.”

### **Next Steps**

As Banner Health looks in the direction of next steps for their infrastructure, the organization is heading towards a thin client environment as they further integrate into the Cerner suite for the electronic medical records (EMRs).

“Right now a lot of our applications are still in the fat client, but as we continue to move into Cerner, we will eventually be in a thin client Citrix environment that will be served up out of Phoenix,” says Rains.

In remote rural areas where data circuit costs are high, Rains believes Banner Health will see tremendous cost savings with no recurring fees other than maintenance costs for the equipment.

With the continued introduction of new medical applications, Rains is certain that the organization will realize more benefits from their new optimized WAN in the future.

“The Cerner EMR suite has been a strong driver in the move to optimizing our WAN so we can be sure we are providing an optimal end user experience and attracting top physician talent at all of our hospital facilities,” says Rains. “Small rural communities can sometimes be tough sells for attracting physicians. If we can offer not only a good quality of life in small towns but great hospitals to work in that have a top notch IT infrastructure, including an optimized WAN and the latest technologies, we think we will attract the best.”

### PRODUCT LIST

#### Cisco Application Networking Services:

- Cisco WAAS for WAN optimization
- Cisco WAE 512 Appliances
- Cisco WAE 7326 Appliances
- Cisco Integrated Services Routers (ISR)

### For More Information

Find out more about Cisco WAE and Cisco WAAS solutions, please visit <http://www.cisco.com/go/waas>.



**Americas Headquarters**  
Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
[www.cisco.com](http://www.cisco.com)  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 527-0883

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

**Europe Headquarters**  
Cisco Systems International BV  
Haarlerbergpark  
Haarlerbergweg 13-19  
1101 CH Amsterdam  
The Netherlands  
[www-europe.cisco.com](http://www-europe.cisco.com)  
Tel: +31 0 800 020 0791  
Fax: +31 0 20 357 1100

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