

CONCORD HOSPITAL DELIVERS FAST, CONSISTENT APPLICATION RESPONSE TO CRITICAL MEDICAL APPLICATIONS WITH THE WX SERIES



Industry: Healthcare

Challenges:

- Deliver a consistent user experience for healthcare professionals at the main hospital campus, health centers, clinics and physician offices
- Ensure fast and consistent application response for business-critical clinical and administrative applications
- Support New Hampshire statewide initiative for electronic prescriptions

Selection Criteria: Experienced with Juniper Networks' portfolio of security and remote access solutions, Concord Hospital turned to Juniper for assistance in improving application performance as part of a server consolidation initiative. After examining competitive solutions and piloting the Juniper Networks WAN application acceleration platform, Concord Hospital deployed Juniper Networks' WX Series Application Acceleration Platforms into production at eleven locations.

Network Solution:

- Juniper Networks WX Series Application Acceleration Platform
- Juniper Networks SSG140 Secure Services Gateway
- Juniper Networks SSG500 Secure Services Gateway
- Juniper Networks SA4000 SSL VPN Appliance

Results:

- Forty percent to fifty percent performance improvement on business-critical applications, including electronic medical records (EMR), medical imaging, billing imaging and payroll

Innovation and quality are at the heart of the culture at Concord Hospital in New Hampshire. With a focus on applying the newest medical science and technology to improve patient care, this regional medical system has clinical capability that is comparable to the leading medical centers in major cities across the nation. In fact, Concord Hospital was named as one of the Top 100 "Most Wired" hospitals three years running by Hospitals and Health Networks. The hospital is an integral part in the New Hampshire governor's goal of becoming the first state to have all of its doctors prescribing electronically. It's also one of a handful of medical centers with a CT scanner that can capture images of a beating heart. At Concord Hospital, quality is a top priority, particularly because quality plays an important role in ensuring cost-effective services and improving patient safety.

Challenge

As a leader in healthcare IT, Concord Hospital knows that having a high performance network is the key to delivering exceptional patient care. Clinicians and administrative staff need fast and consistent access to the applications that keep the hospital system running smoothly.

As part of its effort to enable collaboration and deliver cost-effective services, IT launched a major initiative to consolidate applications from its many healthcare centers, clinics and physician practices located across a 40-mile area. Centralizing billing, for instance, would bring much-needed efficiencies, especially for Medicare and Medicaid. Consolidating applications and data once spread across many locations would improve application availability, information security and better support the practice of evidence-based medicine.

"Our goal was to deliver a fast and consistent user experience, no matter what office a person is in," says Mark Starry, manager of IT infrastructure and security at Concord Hospital. "All applications should run as well in remote offices as they run from the main campus."

Concord Hospital consolidated its suite of clinical and administrative applications, including EMR, billing, human resources, payroll, medical imaging and business imaging to its data center on its Concord campus. It also deployed a computerized provider order entry system (CPOE) to eliminate handwritten orders. Many of these applications run over a Citrix application delivery infrastructure, while other applications are Web-based.

Concord Hospital has a high performance network infrastructure, and relies on a portfolio of Juniper solutions, including routers, firewalls and remote access. The core network is 10 Gigabit Ethernet, with fiber throughout the main campus and connecting

several of its health centers. But for clinics and physician practices in the surrounding rural areas, it had to depend on T1 or T3 WAN connections.

“When we consolidated the applications, we had a revolt,” recalls Starry. “We looked at the WAN utilization and saw some periods of high traffic, but the utilization was acceptable for the majority of the day. We saw a huge latency for Web-based applications.”

Selection Criteria

Network latency was such a serious issue that it threatened the success of the server consolidation project. Starry needed a solution to the network latency problem—and fast. As a user of Juniper Networks solutions, he turned to his Juniper account team for advice. Juniper recommended the WX Series and quickly provided evaluation units and engineers onsite. Starry also considered three other application acceleration products.

“Juniper got the WX Series working quickly and efficiently without interruption to network operations,” says Starry. “The competitors sent us a box and said, ‘Call us.’”

Starry piloted the WX Application Acceleration Platform in the office that had the most severe performance problems—one with 4.5 Mbps WAN connection. “We saw immediate success with the pilot. Word gets around quickly here, and when people heard about the performance, they wanted a WX Series for their location too. So we went straight into production at the other sites,” says Starry.

Solution

With the WX Series, Concord Hospital was able to provide fast and consistent application response across the WAN to allow physicians, clinicians and staff access to their most critical applications. In healthcare, the importance of real-time access to applications goes well beyond the need to improve employee productivity or meet business objectives—it literally can mean the difference between life and death.

“Once we deployed the WX Series, we accomplished our goal of providing a fast and consistent user experience across the WAN,” says Starry. “Some people say that the applications run better in remote sites than at the hospital.”

“Once we developed the Juniper WX Series, we accomplished our goal of providing a fast and consistent user experience across the WAN.”

Mark Starry,
Manager of Network Infrastructure and Security, Concord Hospital

The WX Series is a best-in-class application acceleration platform that delivers fast and consistent application response with the performance and scale to support large application deployments. With the WX Series, Concord can accelerate its business-critical applications, including GE Centricity EMR electronic medical records, Kronos Payroll, McKesson Medical Imaging and Document Imaging.

Concord Hospital deployed the Juniper Networks WXC590 Application Acceleration Platform at the data center and the Juniper Networks WXC500 Application Acceleration Platform or Juniper Networks WXC250 Application Acceleration Platform at its 10 remote sites. “Everyone was happy. Calls related to performance issues on the WAN were reduced significantly,” says Starry.

The WX Series accelerates mission-critical applications and rich content by recognizing and eliminating redundant transmissions using advanced compression and caching techniques. This is even more critical for the bandwidth-intensive nature of medical imaging, billing imaging, large file transfers and network backup/replication. The WX Series also speeds delivery of Web applications by speeding application-specific protocols, such as TCP, UDP, HTTP/S, MAPI and CIFS. This is essential for Concord’s EMR, payroll, email and file/print services. In addition, the WX Series real-time business applications by prioritizing and allocating bandwidth with quality of service (QoS) and policy-based multipath features to ensure that critical applications are given priority access to the network.

While pleased with the fast application response, Starry is delighted by the consistent application performance. The Juniper Networks WX Central Management System software provides the network and application visibility to deliver applications exactly as intended.

“The WX CMS software allows us to visualize how users feel about application performance and to see it in real time,” says Starry. That allows users to work without interruption. It also enables the IT team to proactively manage network and application traffic, which improves operational efficiency.

In addition to application acceleration, Concord relies on Juniper for best-in-class routing and security technologies in the data center. The Juniper Networks SSG140 has a comprehensive set of optional Unified Threat Management (UTM) security features to protect against network and application attacks while also stopping content-based attacks. The Stateful inspection firewall is used to perform access control and stop network level attacks. The IPS (Deep Inspection firewall) stops application level attacks. UTM security features on the SSG140 also protect against worms, Spyware, Trojans, and malware. Preventing application-level attacks is particularly important for its wireless voice over IP (VoIP) communications in its emergency department (the largest in



New Hampshire) so that physicians and nurses can communicate instantaneously without paging or picking up the phone. Vocera is a small “badge” that can be worn and is voice-activated.

Concord Hospital also uses the SA4000 SSL VPN to provide its health professionals with the ability to access key applications anywhere at any time using a Web browser.

Results

With fast and consistent application response across the WAN, clinical and administrative staff at Concord Hospital now have uncompromised access to the most business-critical applications and services.

Performance for key applications, including EMR, payroll, and medical imaging and billing has improved 40 percent to 50 percent. Users have seen significant improvements in file and print performance. Opening a Microsoft Access database might take 15 minutes without acceleration and mere seconds once it’s cached. Storage and backup performance also improved—backup went from three hours to 45 minutes.

“We were able to move servers from remote offices to the data center, which saves on the cost of hardware and cooling costs in the closets,” says Starry.

IT prioritizes and allocates bandwidth with QoS on the WX Series to ensure that business-critical transactions are given the priority they need. “A single person could create utilization issues even with a T3 circuit to the Internet,” says Starry. Traffic is classified as business critical, normal and standard. The GE Centricity EMR runs at the business-critical class, other applications run at the normal class, while file transfers and Internet downloads run at the standard class. The WX Series will throttle down the speed of low priority file transfers so that the network capacity is not oversubscribed and important business applications won’t be affected.

“One of the biggest things I like about the WX Series is the self-tuning,” says Starry. “You prioritize your applications and then let the thing go.” He cites the visibility into the network as well as the ability to prioritize and allocate bandwidth as the major deciding factors over competitive solutions. “The WX CMS Software is far ahead of the competition.”

Concord Hospital not only valued Juniper’s solution with Application Acceleration, Routing, Security, and Remote Access products; it also valued Juniper Networks Technical Assistance Center (JTAC). Starry says their experience with JTAC has been stellar. “Juniper’s support was hugely important to the process and JTAC is one of the best support organizations that we have ever dealt with.”

Next Steps and Lessons Learned

Next on the IT project list is the upgrade of Concord Hospital’s standalone firewalls with the SSG500 Series. Concord has been experiencing reliability problems with the incumbent firewalls, and maintenance contracts with the vendor had become unaffordable.

“Firewalling alone is not what people need anymore,” says Starry. An integrated security solution that can act as a combination firewall and routing device can lower capital and operational expenses. Concord Hospital is deploying the SSG500M, which delivers an ideal mix of security and LAN/WAN connectivity. The SSG Series has dedicated security-specific processing hardware and a complete set of optional UTM security features.

Concord Hospital has more plans for Juniper WX Series platform, as they will play an important role in an initiative for electronic prescriptions sponsored by the New Hampshire governor. The goal is to have all of its doctors prescribing electronically by late 2008. Electronic prescriptions cannot be written, fulfilled, or updated back to the EMR at the hospital if the network connection is down. Concord Hospital plans to take advantage of the policy-based multipath feature on the WX Series to ensure that these critical exchanges get through.

“The problem isn’t just failover,” Starry describes. “The problem is that if you have a fast Internet connection and fail-over to a slower connection, there will be utilization issues upon failover.” With policy-based multipath on the WX Series, IT can be assured that there are pipes large enough to support the traffic load if failover occurs because of a service degradation or outage on a WAN connection. “As far as I know, no other vendor can do this,” says Starry.

Starry is planning to turn on the SSL acceleration feature in the WX Series, especially since many of Concord’s key medical applications are migrating to SSL encryption to meet HIPAA requirements. “As our Web applications move to SSL, we’ll implement the SSL acceleration,” he says.

About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at www.juniper.net.

Corporate And Sales Headquarters

Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, CA 94089 USA
Phone: 888.JUNIPER (888.586.4737)
or 408.745.2000
Fax: 408.745.2100

APAC Headquarters

Juniper Networks (Hong Kong)
26/F, Cityplaza One
1111 King's Road
Taikoo Shing, Hong Kong
Phone: 852.2332.3636
Fax: 852.2574.7803

EMEA Headquarters

Juniper Networks Ireland
Airsides Business Park
Swords, County Dublin, Ireland
Phone: 35.31.8903.600
Fax: 35.31.8903.601

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