BROCADE

CoxHealth

CoxHealth Makes Outstanding Patient Care Easier to Deliver

Located in Springfield, Missouri, CoxHealth is a locally owned, not-for-profit health system, serving 24 counties through five hospitals and 83 clinics. Technology is the healthcare system's backbone. Since 1997, CoxHealth has steadily embraced new technologies to enhance patient care. The system was named a "2014 Most Wired Hospital" by Hospitals & Health Networks magazine and it ranks among the top 100 integrated healthcare networks by SDI.

"Healthcare is the ultimate 24×7 business," said John Liehr, Network Team Lead at CoxHealth. "The most important attribute of a healthcare network is agility. We need to be able to deliver services as clinicians need them, with a continuous user experience—no matter where they go or what they're trying to accomplish."

EXECUTIVE SUMMARY
CHALLENGE
Deploy a network infrastructure that enables the healthcare system to achieve a single patient record for unmatched continuity of care and a superb user experience

SOLUTION
- Brocade ICX 7750 Switches for aggregation
- Brocade ICX 7450 Switches for access
- Brocade ICX 6610 Switches for access
- Brocade MLX Series Routers for carrier-class core routing
- Brocade DCX Backbones for the SAN
- Brocade NetIron CES 2000 Series switches for IP routing
- Brocade VDX Switches in the development and test environment
- Brocade Network Advisor

RESULTS
- Increased network reliability from two nines to four nines and greatly reduced disruptions
- Reduced PACS image loading from 40 seconds to two seconds
- Successfully integrated third-party wireless LAN to deliver a consistent user experience everywhere in the system
- Built a network foundation to support business needs for the next decade

Moving Vision and Goals to Reality

However, CoxHealth's original network architecture was far from agile. In fact, it was often unreliable and unpredictable— which significantly affected clinical operations.

"We had a flat Layer 2 network built on disparate vendors," said Dan Brewer, Senior Manager for IT at CoxHealth. "When something happened to the network, that single event took the whole place down. We experienced significant downtime weekly, and we had to drop everything to remediate it."

Medical applications were also placing new demands on the aging architecture. From a business perspective, healthcare systems are shifting to a pay-for-performance model. They must deliver a superior, continuous patient experience—

whether the patient is treated in a hospital, at a remote clinic, or as an outpatient. CoxHealth had begun migrating to a single electronic health record (EHR) approach, but it needed a robust network infrastructure to support it across the entire organization.

"Our vision is to be the best for those we serve," said Lynne Yaggy, Chief Nursing Officer and Vice President of Clinical Services at CoxHealth Branson. "As a health care provider, we can't provide continuity of care if we don't have the technology to support us. We've seen the evolution from paper charts—with their inherent vulnerabilities and errors— to the possibility of one chart everywhere it's needed. That's huge from a patient care standpoint."

A Strategic New Approach

In 2012, CoxHealth entered into a strategic partnership with Cerner Corporation. Already a long-time Cerner customer, the new alignment would enable CoxHealth to rapidly advance its healthcare system and deploy new capabilities to optimize resources, achieve efficiencies, and reduce costs. Part of the initiative included a significant overhaul of CoxHealth's wired and wireless networks. Cerner worked closely with the CoxHealth IT team to evaluate multiple network vendors' offerings before making a decision. Brocade® solutions offered everything CoxHealth needed.

"We used some Brocade solutions already, but we took a step back to compare vendors and make sure of what we wanted," said Brewer. "We elected to stay with Brocade, based on performance, price, sizing, and ease of integration. We have not been disappointed."

A New Foundation for the Future

The new CoxHealth network relies on Brocade solutions across the WAN, from the core through aggregation and edge layers, to the storage area network (SAN) in the data center, and for network management. Brocade MLX® Series Routers perform resilient, carrier-grade routing between data centers over 10 Gigabit Ethernet (GbE) dark fiber links, as well as connect all CoxHealth locations. Brocade MLX Routers enabled CoxHealth to simplify its network by collapsing core and aggregation layers with Metro Multiprotocol Label Switching (MPLS) connectivity to Brocade NetIron CES Series Switches. Now the CoxHealth IT team can migrate virtual machines between data centers without having to create and extend numerous virtual LANs (VLANs) across all facilities.

In addition, Brocade ICX® Switches play a variety of roles for CoxHealth. Brocade ICX 7450 stackable switches provide 40 GbE uplinks in its access layer, enabling CoxHealth to scale and easily accommodate rapid growth in the future. In addition, the Brocade ICX 7450 Switches support Power over HDBaseT (PoH). This new, high-power standard delivers up to 95 watts per port through a standard Ethernet cable. As new medical devices are introduced that support the emerging Power-over-Ethernet standard, CoxHealth will be ready to support them. Brocade ICX 6610 Switches are one RU 10/40 GbE Ethernet switches deployed at many CoxHealth locations. These industry-leading switches deliver 10/40 GbE density, unmatched price performance, and seamless scalability. At CoxHealth, they provide access for campus LAN traffic and connect to the Brocade MLX Routers over 10 GbE links. Compact, stackable switches, they provide unprecedented performance, resiliency, and flexibility, making them ideal for delivering critical healthcare applications, such as imaging, video, and real-time collaboration. In addition, Brocade ICX 6450 Switches are used in Cox College and in remote clinics and office settings, where they provide cost-effective enterprise-class performance.

"The Brocade ICX Switches, particularly the Brocade ICX 6610, help us manage the network without interrupting availability," says Liehr. "We can easily update software while limiting the impact of that update."

At the CoxHealth Branson Hospital campus, the network architecture is similar. Brocade MLX Routers at the Med Plaza building provide WAN routing between all locations. Brocade ICX 6610 Switches aggregate traffic into the Med Plaza router. Brocade ICX Switches are also deployed in various configurations on each floor of the various buildings and for critical areas including for Radiology, Oncology, Labs, and the Emergency Room.
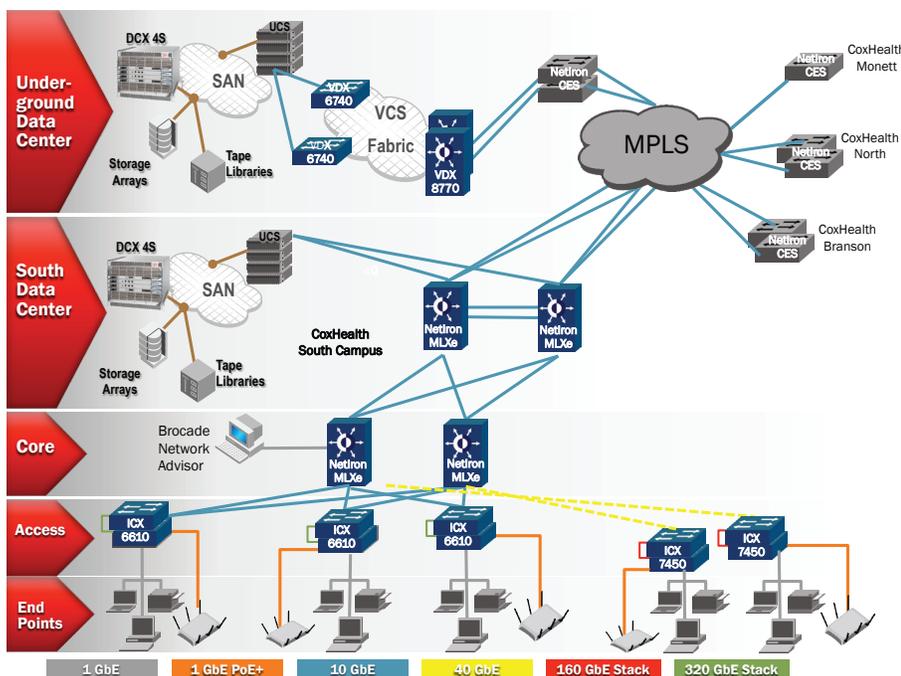

Figure 1: CoxHealth relies on Brocade data center, campus, SAN, and LAN solutions to achieve a highly reliable wired infrastructure.

"We have been using Brocade DCX® Backbones for our 300-port SAN over the past several years," said Liehr. "It primarily supports our PACS, and the Brocade SAN has been highly reliable. We have yet to experience a single failure that caused downtime."

Brocade ICX 7750 Switches (not shown in Figure 1.), which offer unprecedented port density and chassis-level performance and scalability, provide switching for the healthcare system's Cisco UCS servers and VMware deployment. Additionally, they support CoxHealth's Virtual Desktop Infrastructure (VDI) environment and are paired with Brocade VDX® Switches in the data center's "sandbox" development and testing environment. This combination enables scale-out networking. A hybrid-port mode feature provides a migration path to future Software Defined Networking (SDN) efforts at CoxHealth.

Reliability Gains Eliminate Unplanned Downtime

"Reliability gains have been the biggest improvement for us," said Brewer. We've gone from weekly downtime to 'four 9s' of availability and I expect to surpass that."

With the new Brocade infrastructure, CoxHealth was able to move a complete emergency room and critical care unit into an entirely new facility without disruption. And to keep things running at peak performance, Brocade Network Adviser helps CoxHealth proactively address any issues. From a single pane of glass, the team has visibility to drill down to an issue anywhere across the campus, data center, and SAN infrastructure.

"As we've completed the network remediation, we have eliminated unplanned downtime," said Brewer. As the IT organization, we are now out of sight and out of mind—just a utility service. And that's the way we like it."

Radiology is Now the Picture of Performance

One of the most profound performance improvements occurred in the radiology department.

With the old wireless network, radiologists frequently experienced poor performance in their Picture Archiving and Communication System (PACS). Computer tomographic (CT) images consistently took 40 seconds to load, and peak loading times approached four minutes. For radiologists who need to read hundreds of images and quickly provide findings to physicians, that time was maddeningly slow, unpredictable, and lacked sufficient coverage.

A Brocade ICX 7750 Switch and its 10 GbE connections removed a network bottleneck and reduced image-loading times to less than two seconds. For the radiologists, the performance increase has greatly improved productivity and responsiveness.

Integration with a Consistent User Experience

Network integration is essential for delivering a consistent user experience across wired and wireless networks. With its open-standards philosophy, Brocade solutions easily integrate with other vendors' systems. For example, CoxHealth meshed its Cisco wireless network with the Brocade wired network and obtained a consistent, uniform delivery platform that provides clinical users with much greater agility.

"We want to provide the best care for all patients in our community, and with integrated technology systems, CoxHealth is delivering excellent patient care," said Theresa Barton, Assistant Nurse Manager for CoxHealth's Critical Care Unit. "Now we can access applications anywhere and get patient information in real time."

WHY BROCADE

"As we move forward, our network gives us the high resiliency, exceptional performance, and agility that we need to provide our physicians, staff, and patients with extraordinary levels of service. Brocade offers the high-quality support, equipment longevity, and affordable pricing that lets us satisfy our users and continually leave a good impression."

— Dan Brewer,
   Senior Manager for IT, CoxHealth

Looking Forward

It's an exciting time at CoxHealth as the healthcare system has invested heavily in new buildings and new technologies for delivering outstanding patient care far into the future. With an enterprise-wide Brocade network that spans the campus, data center, and SAN, the IT team looks forward to the future with confidence. CoxHealth now has a network that allows it to easily increase capacity in its closets, migrate to 40 GbE in the data center, and support robust medical technologies for 10 years down the road.

In addition to excellent technologies, Brocade provides CoxHealth excellent support every step of the way. "Our local Brocade team has been amazing," said Liehr. "They are continuously engaged with us. We meet regularly, review open support cases, and discuss network designs and our future plans. Brocade is an integral part of our future planning and growth."

"As we move forward, our network gives us the high resiliency, exceptional performance, and agility that we need to provide our physicians, staff, and patients with extraordinary levels of service," said Brewer. "Brocade offers high-quality support and affordable pricing that lets us satisfy our users while leaving a good impression. As network technology evolves, we have comfort in knowing that Brocade solutions are SDN-ready, giving us a platform for longevity, where we can continually innovate for enhanced care delivery."

According to Liehr, Brocade provides CoxHealth with a platform that the team can take to any facility or location and deliver a consistent experience. That flexibility enables clinicians and administrators alike to deliver the high levels of patient care that set CoxHealth apart.

Next Steps

One of the next steps for CoxHealth is opening a new patient tower in 2015. The new patient tower will house a Women's and Children's Hospital and a Neuroscience Center, with room for expansion.

"We started our journey more than 10 years ago, looking to move to a single patient record across our enterprise," said Yaggy. "It's an intentional, methodical journey. By having a single record, we're able to provide patients with continuity of care, no matter what facility they go to. No matter where they enter into our system, we will have the same resources and information to make clinical decisions. I can't put a value on that, it's huge."

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