

# Carilion Clinic



Riverbed® SteelHead™ WAN optimization saves non-profit health care service \$1 million per year in network costs to spend on patient care.

Carilion Clinic is a non-profit health care organization consisting of seven hospitals along with a number of outpatient care centers. Headquartered in Roanoke, VA, Carilion provides health care to nearly one million patients throughout southwest Virginia.

**2x** capacity increase overall

### In Brief

#### Challenges

- Reduce IT costs to maximize resources available for patient care
- Improve performance at rural locations with only 10 mbps circuits available
- Increase the speed of daily data replication

#### Solution

- Riverbed® SteelHead™ WAN optimization

#### Benefits

- Nearly \$1 million saved annually
- Faster patient care through speedier access to PACS and EPIC
- WAN optimization averaging 40% data reduction, 2x capacity increase overall
- 24-hour data replication reduced to 3 to 4 hours

## Challenge: Reduce IT costs for WAN circuits; increase speed of data replication

The outstanding quality of Carilion's health care service is proven by the many awards and certifications won annually by its various hospitals and care centers. Carilion has been recognized in categories such as the "Top 10 Hospitals in Virginia" by U.S. News and World Report, the Beacon Award for Excellence in coronary critical care, the Community Benefit Award, the "Top 100 for hip and knee replacement" and many more.

While its main focus is on providing excellent quality of care within its facilities as a non-profit organization, Carilion also works within its communities to transform the way health care is delivered by investing in charity care (\$71.8 million), community outreach (\$4.9 million), research (\$1.2 million), and professional health education (\$15.2 million). Every dollar received by Carilion serves the community, as does every dollar saved by the wise deployment of technology.

Carilion has primary and secondary data centers in Roanoke, VA. Centralized in the primary data center are mission-critical applications such as a picture archiving and communication system (PACS) application from AGFA, which is used for radiological services, and EPIC, an electronic medical records (EMR) application that is delivered via Citrix.

To provide the level of application performance needed by clinicians for patient care, Carilion had originally purchased OC3 network circuits wherever they were available. In some of the more rural areas of the state, 10-megabit circuits are the upper limit. Regardless of what is available, however, minimizing the dollars spent on broadband would allow Carilion to focus its resources on patient care and its community, helping them fulfill their mission.

Carilion wanted to see if there were savings to be had from WAN optimization. "We had a big push to get the same level of performance we were getting with the OC3s, but for a reduced monthly fee," recalls Ed Eades, Carilion network engineer. And where only the smaller circuits were available, the IT team wanted to improve performance for those end users.

**"An OC3 to one hospital was costing us \$12,000 per month. When we put it down to a DS3, it costs about \$4,000 per month and that's just one sit."**

Ed Eades,  
Network Engineer, Carilion Clinic

## Solution: Riverbed® SteelHead™ WAN optimization

Carilion's IT team didn't have to look far for a solution, since they had already found a way to accelerate data replication between the primary and secondary data centers.

As a health care provider, Carilion must follow the standards set forth in the Health Insurance Portability and Accountability Act (HIPAA). "For HIPAA, we have to log everything, so our transaction logs get absolutely ridiculous," explains Mike Smith, IT director for Carilion Clinic. "The time window was getting to the point that the next replication job was getting ready to start when

the previous day was finishing up. We were getting concerned that we were never going to have a complete replication to the secondary data center."

That issue led the IT team to investigate WAN optimization, which quickly led them to Riverbed®. "At the time we were looking, Riverbed was standing out as the market leader. We were looking at the Gartner reports and such, so we went with Riverbed because everything we looked at said that was the way to go," explains Smith.

Carilion invited Riverbed to do a proof-of-concept (POC) and the difference in performance was impressive. “We were getting in the neighborhood of 10 to 15 times the throughput, so it was a significant improvement over what we had been getting,” says Smith.

A replication that had been taking nearly 24 hours took less than 4 hours once the Riverbed® SteelHead™ appliances were in place.

Carilion was so pleased with the performance of those appliances (SteelHead 7050s) that a decision was made to use Riverbed Technology at remote sites to reduce bandwidth costs. “We had the SteelHeads in the data centers for a month and they were doing really well, so

we decided to start pushing the SteelHead CX physical appliances out to the remote sites as well,” Smith recalls. “Then we started taking our OC3s down to DS3s.”

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Mike Smith,  
IT Director, Carilion Clinic

## **Benefits: \$1 million/year bandwidth savings goes to patient care instead**

Deploying the SteelHead appliances has been successful in exactly the ways Carilion had hoped. Bandwidth expenditures have been reduced significantly because the organization has been able to move from OC3 circuits to DS3 circuits. “Here in southwestern Virginia the difference between DS3 and OC3 is significant because it’s so rural. An OC3 to one hospital was costing us \$12,000 per month. When we put it down to a DS3, it costs about \$4,000 per month and that’s just one site,” says Smith. When they did an overall calculation of savings, it added up to nearly \$1 million per year.

Even though Carilion went to DS3 circuits, the clinicians’ access to data and applications over the WAN is as good as it was with the OC3s and in some cases even better. “In almost all instances, the end users either didn’t know we had made a change or in some instances, commented on how much better things were when we actually took bandwidth away,” says Smith.

There has been an overall average network capacity increase of 2x, but with applications that are latency-sensitive such as the EMR application, EPIC, Smith declares, “We’re getting way more than 2x the optimization on that particular protocol.” And that especially helps end users access EPIC at the rural sites that have only 10 mbps circuits.

When the performance of mission-critical applications like EPIC and PACS improves, the delivery of health care to patients improves and that is always the goal for Carilion. “The Riverbed SteelHeads speed up access. For instance, if someone shows up to the Emergency Department and they’ve got a broken bone, an X-ray is taken,” explains Smith.

“That image now gets to the radiologist a whole lot quicker, which speeds up delivery of services to the patient, and they’re not in the Emergency Department as long.”

Smith wants to add a Alluvio™ NPM Controller to simplify the management of the SteelHead deployment. “We keep adding more and more SteelHeads, so we’re thinking of getting that in place to help us manage our SteelHead fleet,” says Smith.

Carilion is leveraging the benefits it gets from Riverbed to help stay focused on its goal of delivering quality patient care. “We’re not-for-profit, so any money we do make we throw back into the company to deliver services to our patients,” says Smith. “The SteelHead appliances have helped us reduce our operating costs so we can take the money we would have spent on bandwidth and put it back into services for the community.”

## Summary

Every dollar Carilion's IT team can save can be spent on patient care. So in their efforts to ensure the high performance of centralized applications such as EPIC (EMR) and PACS (imaging), they hoped to avoid OC3 connections (\$12,000/month) and use DC3s (\$4,000/month) instead.

Riverbed SteelHead WAN optimization made this possible, saving the company nearly \$1 million/year in bandwidth costs. Even though Carilion went with DS3

circuits, clinicians' access to data and applications over the WAN is as good as it had been with the OC3s and in some cases even better. This means better patient care through speedier access to PACS and EPIC. The system's rural sites with only 10 mbps connections also have good access to EPIC thanks to their SteelHead appliances.

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### Riverbed – Empower the Experience

Riverbed is the only company with the collective richness of telemetry from network to app to end user that illuminates and then accelerates every interaction so that users get the flawless digital experience they expect across the entire digital ecosystem. Riverbed offers two industry-leading solution areas – Alluvio by Riverbed, an innovative and differentiated Unified Observability portfolio that unifies data, insights, and actions across IT, so customers can deliver seamless digital experiences; and Riverbed Acceleration, providing fast, agile, secure acceleration of any app over any network to users, whether mobile, remote, or on-prem. Together with our thousands of partners, and market-leading customers across the world, we empower every click, every digital experience. Learn more at [riverbed.com](https://riverbed.com).