Health System Increases Efficiency and Scalability with Structured Cabling and Network Visibility

CHALLENGES

WellSpan Health is a nonprofit healthcare system located in central Pennsylvania. The health system includes four main hospitals, including York Hospital, Gettysburg Hospital, Ephrata Community Hospital, and the WellSpan Surgery & Rehabilitation Hospital. WellSpan also includes two regional home care organizations and more than 90 patient care locations. The organization employs approximately 12,000.

Prior to teaming with CABLExpress and Gigamon, WellSpan's cabling infrastructure had several individual fiber runs and lacked a TIA-942 recommended structured cabling environment. As the health system transitioned from 1 to 10 Gigabit Ethernet in its network, it required a high-density environment to operate with maximum efficiency.

> *"Two companies that are best-in-class, working together in our environment with taps and with the ability to direct that traffic to the appropriate tools, gets us the visibility that we need," said Echterling. "It's visibility that we never had before."*
>
> *- Randal Echterling, Network Architect at WellSpan*

"We didn't have a really good structured fiber cable scenario," said Randal Echterling, Network Architect at WellSpan. "We were kind of 'hodgepodged' together and just running along patch cables to interconnect devices. As we progressed more and more into higher density, especially as we moved more into the 10 Gig arena, we needed to develop something really solid and really structured."

In addition to lacking a structured cabling environment, WellSpan did not have optimal visibility into its network and was not able to effectively analyze the traffic at each level.

"[The network] didn't give us visibility to determine if there was a problem going on," said Echterling. "We just had to rely on somebody complaining that there was a problem and then we'd have to go into it, almost in ad hoc mode, to try to figure out where the problem existed."

CABLExpress® Gigamon®

ORGANIZATION

Name:	WellSpan Health
Location:	York, Pennsylvania
Industry:	Healthcare
Founded:	1880
Employees:	12,000
Website:	www.wellspan.org

CHALLENGES

- Existing point-to-point cabling lacked efficiency of a structured cabling environment
- Transitioning to 10 Gigabit Ethernet required high-density layer one infrastructure
- Lack of visibility into network traffic limited technology advancements and future growth
- IT staff spent time reacting to issues, rather than proactively monitoring network

SOLUTION

- CABLExpress® Skinny-Trunk® Solution:
  - Fiber Trunks, Harnesses and Jumpers
  - H-Series Enclosures
  - Tap Modules
  - Z-Mount® Brackets
- CABLExpress RSD Series Enclosures
- Gigamon® Network Visibility Fabric™, comprised of:
  - Gigamon GigaVUE-HD4, GigaVUE-2404, GigaVUE-212 fabric nodes
  - GigaSMART® with packet slicing and de-duplication

OUTCOMES

- Structured cabling of layer one infrastructure allows for improved efficiency and reliability of network
- Increased scalability enables efficient planning and framework for future growth
- Visibility into network allows IT staff to proactively monitor traffic and spend more time on business-critical tasks
- Higher level of quality care enhances patient and caregiver experiences across health network

SOLUTION

With a goal of implementing a structured cabling platform and gaining increased visibility into its network, WellSpan partnered with CABLExpress and Gigamon to develop a comprehensive solution. CABLExpress helped design the layer one cabling environment, while Gigamon provided the technology required to achieve network visibility and monitor traffic flow within WellSpan's core data center infrastructure.

As part of its structured cabling system, WellSpan implemented the CABLExpress Skinny-Trunk Solution, consisting of fiber optic trunks, harnesses, and jumpers. This product set is designed to directly integrate with the recommended TIA-942 structured cabling standard and exceed standard industry dB loss budgets, making it ideal for WellSpan's environment. The health system also utilized CABLExpress H-Series enclosures (1U, 4U, 6U and 10U), RSD Series enclosures with corresponding modules and adapter panels, and Z-Mount brackets to facilitate cable management.

> *"WellSpan prides themselves on being innovators and technology leaders and their infrastructure is now capable of moving into the next generation of networking speeds," said Rick Dallmann, Senior Data Center Infrastructure Architect at CABLExpress.*

"We've been able to develop a partnership, an ongoing interactive dialogue, to move forward in technology together," added Dallmann. "They advise us on product improvements and provide a test environment, and we're able to move from prototype to product very quickly."

To achieve its desired solution, WellSpan worked with CABLExpress to custom develop a 16-port tap module, instead of the manufacturer's standard 24-port module. With the 16-port tap, WellSpan was able to fully duplicate the 32-port line card in its Cisco Nexus switches.

"We had CABLExpress develop [the custom module] and they said, 'We can do that for you; that's not a problem,'" said Echterling. "There's flexibility to be able to design something custom to our environment."

CABLExpress created a prototype of the tap module and tested it in WellSpan's live environment, made changes appropriately, and launched the modules in full production.

"This is where it's a partnership. . . we work together to make this product as successful as it can be because we both have vested interest in it," said Echterling. "We want the product to be successful because we're looking to solve a problem."

Once the structured cabling was implemented, WellSpan then partnered with Gigamon to help gain visibility into its network infrastructure. The team implemented Gigamon Visibility Fabric nodes, based on density and scalability requirements, to connect physical data sources, such as CABLExpress tap modules, and Cisco Switched Port Analyzer (SPAN) ports from the network switches. Along with a variety of vendor platforms used by WellSpan for monitoring and analysis, these resources were brought together into one common infrastructure layer, the Gigamon Visibility Fabric.

With the Gigamon Visibility Fabric, WellSpan is empowered with pervasive access to all traffic of interest, with granular control to selectively distribute traffic to appropriate monitoring solutions. This solution allows WellSpan to send ingress/egress traffic through specialized security tools, while only sending web traffic to web tools and voice traffic to voice tools. All of this is accomplished while selectively troubleshooting with targeted network analysis tools.

This multi-layered connectivity provides complete visibility throughout the entire infrastructure. While today supporting

primarily 10G and 1G physical ports, WellSpan is quickly progressing toward 40G and 100G connectivity and VMware-layer visibility, an evolution that is scalable with Gigamon and CABLExpress.

To further enhance its new solution, WellSpan attached several monitoring and security tools to Gigamon's Visibility Fabric. The solution utilizes products from Network Instruments, including long-term GigaStors, which store the data and the long-term analysis. WellSpan also used Riverbed Opnet's Steel Central Application Response to distribute different applications to various groups.

OUTCOMES

With the implementation of a structured cabling solution, WellSpan has been able to increase the efficiency and reliability of its data center infrastructure.

> *"[CABLExpress] has some of the lowest insertion loss that's in the industry," said Echterling. "The quality of the tap, plus the diligence that we have internally on how we handle the connections, has really made our fiber environment very stable."*

Another benefit of the CABLExpress and Gigamon solution is that it has allowed WellSpan to increase scalability and effectively plan for the future growth of its network. The health system has the ability to build its infrastructure based on future needs, knowing that it has optimal visibility.

"We're able to understand the growth patterns of our links and the applications that are consuming that," said Echterling. "It also allows us to set thresholds… to do some capacity planning based on all the traffic that we see."

With a baseline threshold identified, WellSpan is better able to see when network activity shifts outside normal operating boundaries and then effectively address any issues.

"We can build an infrastructure out… we get visibility each step of the way so we can see exactly what's happening," said Echterling. "Gigamon is best-in-class for directing traffic to our tool sets and manipulating that traffic accordingly. If we need to packet slice, we need to header strip… we can use that and gain efficiency by taking care of all the duplicate traffic and sending it out over to our tool set for proper analysis."

As the density of WellSpan's infrastructure continues to increase, the need for visibility is even more critical. The solutions have allowed the health system to maximize the efficiency of its storage capabilities. Previously, some of its 48-terabyte storage units were only able to last a short period of time. With Gigamon's technology, that time has been extended without increasing storage capacity.

"One of the things that Gigamon allows us to do is… we can drop the payload and just save the header information, and be able to store that," said Echterling. "By doing this and by packet slicing… we can increase that length of time with the same amount of storage. Instead of having it where you might be able to store 36 hours, now we might be able to store 72 or 96 [hours]."

Another benefit of WellSpan's increased network visibility is that it allows Echterling's team to spend more time on critical business tasks, rather than troubleshooting when preventable issues arise. If an application within the network is having a problem, WellSpan is able to come to a resolution quicker than before. The traffic from the tap modules in place throughout WellSpan's data center comes into a Gigamon fabric node, and the team is better able to direct traffic to the appropriate tool.

Furthermore, CABLExpress and Gigamon solutions allow WellSpan to quickly analyze traffic throughout its core network, providing the ability to be more proactive in its operations. With efficient monitoring of applications, the IT team can start troubleshooting an environment before WellSpan's end users are aware of issues.

"We were in reactive mode, putting out fires, not knowing what was going on. When we started to get visibility, it helped that out," said Echterling. "We can actually analyze and monitor right now. Our operation center has some of those tools. . . and they can start to see if applications are having problems before they're even reported."

WellSpan's overall goal is to provide quality care to its patients. While clinical staff play an imperative role in achieving this outcome, there are many factors that can impact quality care that occur behind the scenes.

"Imagine sitting in a doctor's office waiting for a result. . . and the doctor can't get into the system to show you or can't pull up the result," explains Echterling. "Now, imagine the stress level that increases. Does the patient care whose problem it is? Is it server, is it network, is it application, is it the doctor's problem? The patient doesn't care. To be honest, they don't need to care."

WellSpan has made substantial efforts to apply leading-edge technology to better serve its patients and allow its caregivers to provide a superior level of quality care. The structured cabling and network traffic visibility solutions the health system has implemented have increased efficiencies and scalability, and have provided a stable framework for continued growth well into the future.

"The technology that's involved. . . that's our responsibility. That's the health system's responsibility to bring that all together. We all play a vital part in that. What drives us is the patient and trying to help them through the health system."

HOW IT WORKS

CABLExpress

- CABLExpress Skinny-Trunk Solution:
  - Fiber Trunks, Harnesses and Jumpers
  - H-Series Enclosures
  - Tap Modules
  - Z-Mount Brackets
- CABLExpress RSD Series Enclosures

Gigamon

- Gigamon Visibility Fabric, comprised of:
  - Gigamon GigaVUE-HD4, GigaVUE-2404, GigaVUE-212 fabric nodes
  - GigaSMART packet modification technology, including packet slicing and de-duplication