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LASER SPINE INSTITUTE

LASER SPINE INSTITUTE®

Location

North America

Industry

Healthcare

Company

Laser Spine Institute

Use Case

- Database
- Electronic Medical Records (EMR)
- VDI
- VSI

Business Transformation

Clinicians were experiencing delays in accessing files for patients. The new solution gives them access to records and images without delay, freeing them to spend more quality time with patients. At the same time, the IT staff spends dramatically less time on storage management, so they can pursue innovative projects that benefit the entire organization.

Challenges

- Legacy storage lacked the performance to support virtualized applications.
- Aging storage infrastructure was overly complex and hard to manage.

- Performance latencies negatively impacted clinician productivity.
- The company faced the challenges of forced data migration and forklift upgrades.

IT Transformation

- Time to open a patient record slashed by up to 95 percent.
- All patient records, including X-rays and MRIs, delivered on high-performance flash storage.
- Effortless storage management frees IT staff to focus on innovative ways to improve the patient experience.

FlashStack

Offering Exceptional Patient Care

At the Laser Spine Institute, there is a single goal: to provide patients with relief from their chronic neck and back pain. To support that commitment, the company's IT organization takes the same attitude. "Our role is to deliver a high level of service to our staff, so they can deliver an even higher level of service to our patients," said Chris Yinger, Senior Director of IT at the institute's headquarters in Tampa, Florida.

"It takes genius to take a complex solution and make it simple. The Cisco and Pure Storage solution is pure genius."

Chris Yinger
Senior Director of IT

Laser Spine Institute is the leader in minimally invasive spine surgery, having helped more than 60,000 patients through seven surgery centers across the United States.

In addition to the mantra of improving patients' lives, a guiding principle for the organization is simplification for operational efficiency. Thus, when the company's spinning-disk storage system hit the end of its lifecycle after seven years, simplification was a key requirement in finding a replacement.

"Our legacy system was innovative at the time it was purchased, with features like tiering, but as the organization grew, it became a management nightmare," Yinger said. "Our team was focused more on managing IOPS than actually delivering value to the organization. To provision virtual desktops, we always had to pin them to solid-state drives to make sure they weren't tiering down to lower levels. It was an unsustainable situation, given all the other data we had in motion."

The Solution: FlashStack

In cooperation with its system integration partner, Presidio, the company's IT team looked at offerings from several storage vendors and eventually narrowed the list to two companies for a proof-of-concept test.

"We wanted to test a cross-section of our entire environment during the POC, so we evaluated a subset of database servers, virtualized applications, and MRI and X-ray images, to see how the storage array worked and what the impact on users was when we pushed it to its limits," Yinger said.

The performance of the combination of Cisco® UCS® servers and the Pure Storage array in the FlashStack configuration delivered the best outcome.

"Hands-down everyone loved the results; they wanted more of it. When we took it away from them at the end of the POC, many people asked how they could get it back. We're talking about a breadth of

end-users, including clinicians, physicians, back-office personnel and IT staff."

After the organization decided to move forward with the FlashStack converged infrastructure from Cisco and Pure Storage, there was a rapid transition from the legacy storage system.

"The hardest part of installing the Pure Storage array as part of the FlashStack configuration was unboxing it," Yinger said. "It took less than two weeks to migrate 100TB of data onto

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>
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> Senior Director of IT

the Pure Storage array. It was a seamless, transparent operation, with zero impact on end-users. The only thing they experienced was the huge performance gain once the transition was completed."

Two FlashStack configurations, each with a FlashArray//M50, were purchased, to serve the main data center in Tampa and a disaster-recovery site.

The new FlashStack converged infrastructure hosts the institute's entire production workload, including its NextGen® Ambulatory EHR, an electronic health record application, supporting Microsoft® SQL Server, Oracle®, and Oracle MySQL databases. The facility is using a combination of Citrix XenDesktop and XenApp to deliver both virtualized applications and virtual desktops to 1000 employees throughout the organization.

The increased capacity delivered by the Pure Storage array—from

100TB raw on the legacy system to an effective 271TB on Pure Storage —has allowed the organization to store its MRI and X-ray images on the new system. "Even though images don't compress well, we still felt it was the right thing to do for our patients to put them on flash," Yinger said. "By offering high-performance, high-availability access to these images, our physicians and staff can stay focused on patient needs, rather than spend time waiting for an image to load. With flash, even an archived image from six or seven years ago can be available almost instantaneously."

The impact of the new infrastructure has been felt throughout the organization.

"The reaction we've had from end-users has been extremely positive," Yinger noted. "In our old environment, it would sometimes take several minutes to open up a patient record. Now, it takes a matter of seconds. As patients move throughout our network

to receive care, the related images, medical histories and vital physician notes are always on hand and available to authorized users."

He adds that they used to have applications that would reach into the hundreds of milliseconds of latency, and that had a very negative impact on staff and patients.

"After we put the Cisco and Pure Storage solution in place, we have seen consistently sub-millisecond latencies. It's phenomenal."

A few weeks after production applications were moved onto the FlashStack configuration, a consultant compared latencies on typical workloads between the new and old storage systems. Average read latency went from 3.24 ms to 0.42 ms, a drop of 87 percent, with maximum latency plunging 91 percent, from 16 ms to 1.47 ms.

Average write latency dropped from 4.24 ms to 0.63 ms, with maximum write latency slashed by 96 percent, from 25 ms to 1.05 ms.

"With our old storage solution, we couldn't easily spin up additional virtual machines or desktops," Yinger added. "Now that we have the FlashStack solution, everyone is running to get a virtual desktop provisioned, not only because it's so much faster than their desktop, but because it's also portable."

FlashStack Solution Simplifies Management

In addition to the positive impact on clinicians and patients, the FlashStack implementation has brought numerous benefits to the IT department.

"The beautiful thing is that we no longer are in the business of managing IOPS," Yinger said. "We just give our users access to VDI and to the resources they need. I can't overemphasize the ease of management with Pure Storage."

Yinger is impressed by the approach Pure Storage takes with its product development and innovative business model.

"A Pure array is purpose-built for flash technology," he noted, "and comes equipped with advanced features without extra charge.

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And the Pure Evergreen™ Storage model—with its stable long-term costs, controller upgrades, and flexible growth path—is such a smart way to do business, because it gives us a stable, long-term understanding of costs, as well as a way to add capacity only when it's needed."

Yinger reflected on the complexity of traditional storage systems and the business model that delivered them. "Smart people can take the complex and make it more complex," he observed. "It takes genius to take a complex solution and make it simple. The Cisco and Pure Storage solution is pure genius."

The FlashStack converged-infrastructure approach is perfectly in sync with the institute's mantra of simplification for operational efficiency. "It has allowed us to simplify the end-points that we manage," Yinger noted. "As a result, my team can focus on more value-added projects for the organization because they

don't have to manage disparate solutions."

An early example of the contribution Pure Storage has made to organizational efficiency came during the two-month proof-of concept. "At the time we were testing the Pure Storage array, I had some staff turnover," Yinger recalled. "I was able to get new engineers trained and up-and-running on the Pure Storage environment in just half a day. Pure Storage delivers a simplified solution that anyone can manage."

Among the standard features of Pure Storage arrays used by the institute are encryption at rest, especially important for securing patient data; snapshots, for helping to ensure easy backup of critical data with no impact on either storage capacity or end-user experience; and data compression and deduplication. "We are seeing 2.8:1 data reduction across our entire storage environment," Yinger reported, "and we expect that to increase further to 5:1 to 7:1

if we remove our X-ray and MRI images from those calculations."

The huge boost in capacity delivered by the Pure Storage array "will allow us to accommodate the growth in patient data well into the future—without worrying about where we will store it, or resorting to techniques like tiering," said Yinger. "We have a lot of innovation going on here, and with Pure Storage, it's no longer an issue whether we have the storage capacity or performance to support that innovation. It's just never raised as an issue."

FlashStack Lowers Operating Costs

The efficiency of the FlashStack solution also has a major impact on operating costs, Yinger reported. "We took 72U for our legacy storage and consolidated it to 6U, a 92 percent improvement for the Cisco and Pure Storage solution.

Power and cooling costs have declined 40 percent and will

continue to decline further as consolidation efforts continue. A Cohesity solution is used for backup and, in combination with Cisco and Pure Storage, has simplified backup while reducing overall software costs by 70 percent over the legacy storage and backup solution. Yinger said he was impressed by the similarities between the Pure Evergreen Storage model and Cohesity's fully distributed forklift-free architecture.

Simplicity also is evident in the Pure1™ management interface. "I can check all the metrics—latency, capacity, data reduction, etc.—right on the Pure Storage app on my phone. I show it to the company's executives all the time, and they are impressed that you can do all that on your phone, wherever you might be," said Yinger.

Before placing an order for his two Pure Storage arrays, Yinger calculated a return on investment of just two years, because he could reduce the hardware footprint even while increasing capacity, eliminate annual support for their legacy system, and reduce backup software costs. He estimates co-location cost savings for the data centers at around US$4,000 month."

Yinger continued to emphasize the solution's operational efficiency in pursuit of excellent patient care.

"There are three pillars we live by at Laser Spine Institute: to deliver an exceptional experience and make a difference in the lives of patients, to help as many patients as possible, and to create efficiencies throughout the organization. Cisco and Pure Storage has been able to help us do all three."

Products and Services

FlashStack Data Center Platform:
- *Cisco UCS Chassis and Cisco UCS B200 M2 Blade Servers*
- *Cisco UCS Manager*
- *Cisco Nexus Switches*
- *Pure Storage FlashArray//M*

Applications:
- *Database: Microsoft® SQL Server, Oracle® MySQL*
- *VSI: VMware® vSphere® ESXi™, vSphere Cloud and vRealize®*

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