![Tintri logo]

Lake Superior College Makes the Educated Decision to Move to Tintri Storage

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Tintri Improves Performance and Simplifies Management of Virtual Servers and VDI Deployment

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Industry
- Education

Geography
- Duluth, Minnesota

Virtualization environment
- VMware vSphere
- VMware Horizon 6.1
- Traditional storage: HP 2000 and Left Hand storage systems

VM profile
- Windows Server 2003, 2008, 2008r2, 2012, 2012r2, Red Hat Enterprise Linux, CentOS, Suse, and Ubuntu

Key challenges
- Needed to increase storage capacity and improve storage performance
- Planned to deploy VDI for student labs and staff

Tintri solution
- Tintri VMstore™ T820

Primary use case
- Tintri is being used as the default storage platform for all virtualized applications for the community college

Business benefits
- Obtained fast deployment—under 20 minutes from box to first vMotion
- Achieved goal of 98% virtualization
- Obtained extra storage capacity
- Cut latencies from 12-14 ms to 1.6 ms
- Simplified management with intuitive interface and VMware integration

Company Background

Lake Superior College (LSC) is a two-year community and technical college located in Duluth, Minnesota. LSC offers pre-baccalaureate majors for students interested in transferring to four-year educational institutions, as well as more than 90 certificate, diploma, and degree programs in career and technical fields. While the majority of its courses are delivered in traditional classroom and lab settings, LSC also offers over 150 courses online, including dialysis patient care, accounting, business administration, computer and web programming, and an Associate in Arts transfer degree.

IT Challenges

Ryan Schaefer is a senior network administrator at Lake Superior College. His responsibilities include managing the servers, storage, networking, phone system, IP cameras, and other IT systems. Ryan is a VMware Certified Associate for Datacenter, as well as a Tintri Certified Systems Engineer. In early 2014 he was asked to help develop a five-year technology plan for the college. "I was asked to assess where we were from an IT perspective, and accurately predict the budget we would need to do a complete hardware life cycle in our datacenter for the next 5 years," noted Ryan.

LSC had two Cisco UCS chassis with 4 blades each, all connected to various HP SANs with 10K SAS drives. They had a 4GB Fiber Channel HP P2000 SAN, an iSCSI P2000 SAN, and 5 TB of HP Left Hand storage systems. "All of our storage systems were carved into multiple LUNs," Ryan explained. "This caused a lot of what I like to call 'VM admin shell game', where we were continually trying to find that happy balance between our limited resources. We would move our high I/O VMs to the Fiber Channel SAN to improve performance. The FC SAN would fill up quickly and latency would increase. We would then move some other VMs back off the SAN to increase performance. It became quite clear that the existing SAN infrastructure was not designed for the I/O-intensive VM workloads, and that our storage was our weak link. Upgrading our storage environment became our number-one infrastructure improvement priority."

> " If you are experiencing pain with your VMware deployment and things just aren't performing like you expected them to, I urge you to take a look at Tintri storage—especially if you are running legacy SANs. I can't say enough good things about how much of an improvement this one device has made in our environment."
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> **Ryan Schaefer,** Senior Network Administrator, Lake Superior College

Previous Environment

At the time of the storage assessment, LSC's server infrastructure was 75-80% virtualized and plans were already in place to migrate some of the existing physical servers to VMs. LSC's IT team was also looking to implement a VDI solution for its students and staff to use.

LSC's IT team was supporting a very mixed workload. The college's primary infrastructure is Microsoft Active Directory and Exchange. They also have numerous academic servers running Windows Server 2003 to 2012r2, and every version in-between, and several different Linux Distros Red Hat Enterprise Linux, CentOS, Suse, and Ubuntu. The VMware environment had about 60-70 production VMs and 10-15 Test/Dev VMs.

Selection Criteria

The LSC IT team started filling out a 'wish list' for the infrastructure refresh. "We needed a better understanding of our storage and make our best estimate of what we needed to purchase for the next five years," noted Ryan. "We estimated a 7.2% growth rate for our storage footprint. We did take into account some of the virtualization initiatives that were already in place, and compared our projections to the industry standard 10% growth for colleges and universities. With leaving the Left Hand systems as secondary production storage, we estimated a 15 TB hybrid SAN was the best option for performance and capacity for our needs for the next 5 years. We also wanted the SAN to have VMware integration and an easy-to-use management interface."

The LSC IT team began the process of evaluating several hybrid SANs. "After looking at dozens of options, we narrowed it down to our three finalists: Nimble, Tegile, and Tintri," Ryan shared. "Tintri was unique in that it was purpose-built for VM environments. We also liked the simple management interface and single NFS volume, and the ability to monitor it directly in the vSphere Web Client. It was reassuring to know that this particular storage was built FOR virtual workloads rather than being adapted to it."

Faster Implementation

LSC purchased its first Tintri T820 system earlier this year. "The installation of the Tintri SAN from box to the first vMotion took just under 20 minutes," Ryan reported. "There was some preparation that had to occur before the installation date, such as installing the VAAI plug-in to all the hosts, creating a vCenter service account for the Tintri, and configuring some switch ports for NFS. Tintri provided a nice site preparation sheet as well as excellent documentation on how to get everything configured down to the detailed permissions the vCenter service account needed."

Simpler Management

LSC configured the Tintri systems for AD integration, enabling the IT admins to use their AD credentials to log into the storage. "I really don't log in to the Tintri systems very often," Ryan admitted. "I only log into it for the occasional firmware updates. I can see the overall performance from the vSphere Web Client as well as the statistics for individual VMs. LSC is the largest two-year college in the State of Minnesota and managing IT keeps me very busy. Minimizing the time I spend managing the server and storage environment means I can focus on improving something else."

Better Performance

While vMotioning the first batch of servers over to the Tintri systems, Ryan quickly discovered that LSC's old HP SANs just could not keep up. "We could only move about five VMs at a time," he explained. "If we attempted any more, we would receive high latency warnings for the datastores we were vMotioning from. We immediately noticed the performance increase in the servers that were running on the Tintri. On our old HP FC SAN, 12-14 ms latencies were considered good. Now our entire virtual server infrastructure averages around 1.6 ms latency, and 80% of our VMs have no measurable amount of latency at all."

After moving to Tintri, all of LSC's servers had a noticeable increase in responsiveness. "It was amazing how much better the old SANs began performing as their workloads were offloaded to the Tintri appliance," noted Ryan. "This reinforced the fact that the old systems could handle just a few VMs, but they certainly couldn't run 30 or more. Within a week, I had moved all of the production workloads onto the Tintri appliance and it never flinched. Since installing the Tintri systems, we are now 98% virtualized, and the total VM server count is 128."

Moving to VDI

The LSC IT team is now deploying VMware Horizon 6 to replace its existing Citrix solution, for use by staff needing access to State of Minnesota records while off-site. "We have designated two Cisco UCS blades and a portion of the Tintri to this project," Ryan explained. "We have already replaced two computer labs and are starting with 50 virtual desktops. Tintri works beautifully for VDI and it has performed flawlessly. I've been able to create full VM clones in just 37 seconds. That's not even enough time to go and refill my coffee!"

Conclusion and Advice for Others

When asked what advice he would give to others looking for a better storage platform for virtualization, Ryan replied, "If you are experiencing pain in with your VMware deployments and things just are not performing like you expected them to, I urge you to take a look at Tintri storage—especially if you are running legacy SANs. Also, make sure to look at the big picture to see how a single purchase or improvement can benefit other systems. I can't say enough good things about how much of an improvement this one device has made in our environment."