Technology nonprofit cools down, speeds up with HP Adaptive Infrastructure

TechSoup saves time, money, and space using the HP BladeSystem and VMware

techsoup

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HP customer case study: Power and cooling, server virtualization

Industry: Nonprofit (Technology)

Objective

Enable the creation of a next-generation data center through server consolidation and virtualization

Approach

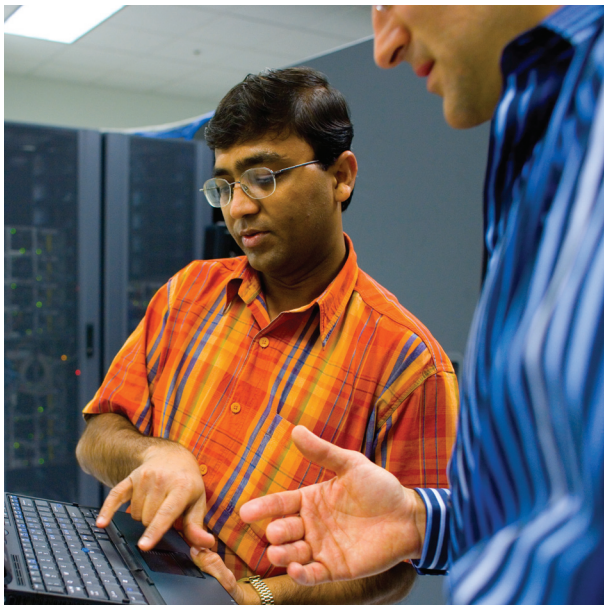
Trade in old servers, install HP BladeSystem and VMware virtualization software, and integrate the entire solution with the storage area network

IT improvements

- Reduced server room temperature from 85° F to 70° F
- 99% faster server deployment (30 minutes vs. 2 weeks)
- 80% faster setup for QA and staging infrastructure (3 days vs. 3 weeks)

Business benefits

- 18 servers consolidated onto 4 in collocation production environment
- Projected 60 servers consolidated onto 4 at headquarters
- 72% reduction in power usage at headquarters data center
- $40,000 cost avoidance on HVAC upgrade
- $24,600 annual savings in server administration time



Technology for the common good

The right technology can help nonprofit organizations make the most of their limited budgets by expanding their reach and maximizing productivity. However, the right technology is often expensive, and many nonprofits don't have the internal expertise to implement and support it.

Since 1987, San Francisco–based TechSoup—itself a nonprofit organization—has helped other nonprofits around the world build sustainable technology systems that foster their missions. In 2007 alone, TechSoup distributed $250 million worth of technology products (retail value) into the nonprofit sector.

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When the organization received a generous donation of collocation space in 2007, it saw an opportunity to consolidate its data centers and replace its aging Dell servers.

Building a next-generation data center
The opportunity to upgrade its servers led TechSoup to consider how a virtual environment could help it save money and become more efficient—both at its new data center and at its San Francisco headquarters, where TechSoup still runs many of its core infrastructure applications and conducts testing and development.

"We made a decision to go with blade servers so that we could increase rack density and use less space and power," says Tim Suttle, director of IS infrastructure at TechSoup. "We also decided to invest in a storage area network (SAN) and completely virtualize our production environment using VMware."

TechSoup contracted Dasher Technologies, Inc., an HP Partner based in San Jose, to install two HP BladeSystem c3000 enclosures—one for the collocation facility and one for headquarters—as well as 10 HP ProLiant BL460c server blades with Quad Core Intel® Xeon® L5400 series processors. The project even included a trade-in of 10 old Dell servers, for which HP provided hardware recycling services. TechSoup also purchased two 3PAR InServ E200 Storage Servers, one for each site, and uses the iSCSI protocol to connect them to the network.

Dasher provided two weeks of deployment services. "Dasher was great from start to finish," says Suttle. "They kept us informed of the pros and cons of the BladeSystem c3000 enclosure vs. the c7000, and helped us make the right choice for our power situation, server needs and budget. They made sure that everything was connected to the SAN and properly integrated into our network environment."

Since the HP BladeSystem c3000 enclosure—nicknamed "Shorty" due to its compact profile—is able to run on standard 110-volt power, TechSoup was able to save $5,000 by not having to run 220-volt power to the server racks in its headquarters facility.

Consolidating 18 servers onto 4
TechSoup was able to consolidate 18 physical servers onto four BL460c server blades in its new collocation environment, completing the move in February 2008. The organization is now turning its attention to introducing similar efficiencies at its San Francisco headquarters, where Suttle expects to see even greater space savings by consolidating most of the facility's 60 servers onto the HP BladeSystem.

"Many of our test and dev systems are great candidates for virtualization, since they are currently running on dedicated servers that are underutilized," he says. "We're still in the process of deciding what to virtualize here in San Francisco. But I will say that in almost all the systems we've virtualized, we've seen an improvement in performance as well as a reduction in the use of physical RAM."

Although TechSoup's initial virtualization assessment showed potential consolidation ratios as high as 20-to-1, Suttle says that a 15-1 ratio is more likely. "We have room to grow, as well as leeway to move hosts around using VMotion, so we can perform hardware maintenance and load firmware updates without disrupting services," he says.

Reducing server room temperature from 85° F to 70° F
The server consolidation was also part of TechSoup's GreenTech initiative that was sparked as much by business needs as environmental stewardship. One of the server rooms at headquarters was regularly overheating, often forcing IT staff to proactively power down non-critical systems to keep the temperature stable.

About TechSoup

Founded in 1987 as CompuMentor, TechSoup (www.techsoup.org) is a nonprofit technology assistance provider with 160 employees. It conducts programs on the international, national, and local level, including a distribution service for technology donations, TechSoup Stock (www.techsoup.org/stock).

"We were consistently up around 85 degrees Fahrenheit," says Suttle. "We started bringing in portable air conditioning units and tons of fans—anything and everything we could do to cool it down."

The first step in the physical-to-virtual migration at headquarters involved targeting servers with the worst heat output and power consumption and moving them to virtual machines. By doing so, TechSoup has achieved a 72 percent reduction in power usage at its San Francisco data center.

"We're down around 70° F in the server room now, and we expect to get lower than that," says Suttle. "As a result, we no longer have the corresponding availability issues. Also, without virtualization we would have required a $40,000 retrofit and upgrade of the HVAC unit."

Flexible networking, scalable chassis

A key factor in TechSoup's selection of the HP BladeSystem was the number of network interface card (NIC) slots available on each ProLiant server blade. "We needed six on each blade," says Suttle. "We didn't want a situation where a single NIC failure would necessitate immediately moving hosts off that blade. Also, because of the iSCSI SAN, port density was a major concern. We wanted redundant connections from each of the blades to our private network, our DMZ network, and to the iSCSI mesh."

TechSoup can now roll out new virtual machines in less than 30 minutes using operating system (OS) templates instead of waiting two weeks to procure a physical server and then install and patch the OS. It can also install new physical servers faster, thanks to HP Virtual Connect technology.

Customer solution at a glance

Hardware
- 2 HP BladeSystem c3000 enclosures
- 10 HP ProLiant BL460c server blades with Quad Core Intel Xeon L5400 series processors
- HP StorageWorks MSL2024 tape library
- Two 3PAR InServ E200 Storage Servers
- Extra network interface cards for VMware

Software
- HP Insight Control Environment (ICE) for BladeSystem
- HP Insight Power Manager
- HP Virtual Connect
- VMware ESX Server 3.0.1
- VMware VirtualCenter
- VMware VMotion

Operating systems
- Microsoft® Windows® Server 2003, 2000
- Fedora and SUSE Linux

Dasher Technologies Services
- Preconfiguration, deployment, and networking services

"HP Virtual Connect is a huge benefit for us because we can virtualize the MAC addresses for all our NICs," says Suttle. "This gives us peace of mind that if we have to replace an entire blade for whatever reason, we don't have to reconfigure anything with the SAN or VMware to present the storage to the new blade. It takes about an hour to get a new server up and running, instead of the two hours it used to take."

The expected useful life of the c3000 enclosure was also paramount. "The passive nature of the BladeSystem chassis is expected to accommodate future server and processor types, so we're confident that we won't need to replace or upgrade the chassis for quite a while," Suttle explains.

Enhanced remote management, better testing

TechSoup has also simplified server administration and saved staff time by using remote management tools included in the HP Insight Control Environment (ICE) for BladeSystem, such as HP Insight Power Manager.

"We don't need a remote KVM to connect to the c3000," says Suttle. "And we don't need any type of remote power management strips to control the power to the blades because that's all integrated into Insight Power Manager. In an emergency, we can remotely hit the power button on an entire blade if we need to. We saved approximately $25,000 on remote KVM, remote power and remote virtual media hardware that we would have had to purchase had we not gone with the HP BladeSystem."

Suttle estimates that the HP remote management features combined with the efficiencies of VMware VirtualCenter reduce server administration time by 40 to 50 hours a month, saving the organization up to $24,600 a year.[1] "We no longer have to drive 50 miles or open a remote support ticket," says Suttle. "We can now address most server administration issues remotely through the Insight Control Environment."

TechSoup also has a better testing environment and better quality assurance through the ability to test on identical hardware.

"With VMware, we can take snapshots of hosts and then deploy those snapshots with new names in a new domain, as opposed to having to build new hosts from scratch or restore them onto a physical server," says Suttle. "We're talking about trimming three weeks worth of setup and configuration work down to three days—and that's just one project."

Trickle-down technology

Ultimately, the new HP infrastructure will allow TechSoup to more efficiently focus on its mission of helping other nonprofits make the most of technology.

"There are so many benefits that the HP solution is bringing us," Suttle concludes. "This is something we've wanted to do for a long time, and the stars have finally aligned."

[1] 50 hours/month x $41/hr IT staff time x 12 months = $24,600 annual savings

The $41/hr system administrator time is estimated from an average annual salary for network and computer systems administrators of $62,130 in May 2006, according to the United States Government Bureau of Labor Statistics. At 2,000 hours a year, $62,130 translates to $31 per hour. Add 1/3 to that figure as the estimated cost of benefits, and the total labor cost is $41/hr.

To learn more, visit www.hp.com

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