

University gives high grade to HP Converged Infrastructure

Purdue University significantly decreases backup and recovery times, shrinks physical footprint, and positions for cloud computing with HP Converged Infrastructure



HP customer case study
HP Converged Infrastructure supports virtualized SAP environment running on Red Hat Linux platform

Industry
Higher education

“By implementing an HP Converged Infrastructure, we went from 16 racks of servers and four storage arrays down to three racks total across two data centers, including the storage.”

Dan Schumacher, Director of Hardware Services and Operations, Purdue University

Objective

Implement a converged infrastructure from a single vendor to support SAP environment and provide a robust backup and recovery solution

Approach

Issue an RFP to vendors to provide and assist in the migration to converged infrastructure technologies to support SAP applications in a virtualized environment running on Linux

IT improvements

- Reduced SAP environment from 16 racks to three racks including storage
- Reduced annual power and cooling costs by \$51,000
- Decreased backup and recovery times by more than 50 percent
- Eased administration by standardizing on a single platform
- Provided a single point of contact for servicing entire solution for quicker response

Business benefits

- Improved performance of key HR and financial systems by 50 percent
- Created opportunity to offer private cloud services to other parts of the university

Ivy-covered brick, fight songs, textbooks, and server racks

The word “university” conjures many images, among them brick buildings covered with ivy, professors in tweed jackets, football stadiums filled with proud alumni, and students lugging heavy backpacks across campus. One image the word “university” does not conjure is a data center filled with racks of servers and cables. These days, however, the data center is as critical to the operation of a university as the faculty and staff who teach the students.

Purdue University’s main campus in West Lafayette, Indiana, provides classes for more than 39,000 undergraduate and graduate students. The IT department at Purdue is integral to campus operations, supporting applications for payroll and employee management, student information management, student registration, and online educational programs.

Outline for a new course

The university has two business data centers at its main campus that support its SAP systems; one for production and another for development and testing, with redundancy set up between the two sites. At each site, it had eight racks of legacy hardware and two EMC storage arrays to support its human resources and financial solutions from SAP, its SunGard Banner student management solution, its Blackboard Learn application, and its Oracle databases. The hardware in both data centers was due for lifecycle replacement, so Purdue decided to consider not only other hardware options,



About Purdue University

Purdue University is a leading academic institution, with more than 70,000 students. Purdue has produced multiple Nobel Prize winners, Fortune 500 CEOs, Super Bowl MVPs, Grammy Award winners, and Pulitzer Prize winners. It is a leader in IT technology innovation, having the largest campus infrastructure for research and the nation's fastest campus supercomputer.

About American Digital

American Digital is a Technology Solutions provider with 30 years of helping Fortune 1000 companies and national universities implement complex technology solutions. Recognized as an HP Converged Infrastructure Specialist partner and an HP Cloud Center of Excellence, AD provides cloud, server, storage, and network solutions for customers that need business-critical, enterprise computing.

but changes to its entire infrastructure. It also wanted to virtualize the environment to help increase efficiency and reduce space. "We were primed for a paradigm shift in how we do business. We had challenges with power, cooling, and space in the data centers," explains Dan Schumacher, director of hardware services and operations at Purdue. "We were also running various UNIX servers. We wanted to standardize on a Linux platform, and we wanted to shrink the footprint at both data centers."

"With HP Data Protector, we can take a snapshot and clone our entire system without taking down the SAP environment, so users never lose access."

Edward Evans, Director of Software Services, Purdue University

Purdue also wanted to provide more robust options for high availability and recovery that required less downtime. The university had to take down its SAP environment for more than eight hours at a time to perform backups and system restores to replicate the environment between data centers for redundancy. "We needed infrastructure technologies that would enable us to spin up systems faster to support the business," says Edward Evans, director of software services at Purdue. "We also wanted more flexibility in how we duplicate systems for high availability."

Looking for a new candidate

Besides improving its recovery solution, shrinking the data center, and standardizing on Linux in a virtualized environment, Purdue had two other key requirements. "We wanted the servers, the storage, and the networking managed by one solution if possible, and from one vendor," explains Schumacher. "We also wanted that vendor to perform the physical migration for us, because we could not do it ourselves in the time period we needed to have it completed."

In addition to providing hardware and support for the pilot, HP Technical Services migrated a portion of Purdue's SAP environment from legacy software to Red Hat Enterprise Linux running on VMware. Ken Williams, enterprise account manager at American Digital, explains, "This wasn't about just kicking tires on hardware. The pilot actually proved out that HP could successfully migrate SAP into a virtualized environment on Linux."

The pilot almost proved to be too successful. "The performance improvements we saw in the testing alone were very impressive," says Schumacher. "We had Purdue business partners helping us with the testing, and they didn't want to let the pilot hardware go."

Graduating to a new solution

Using HP Converged Infrastructure technologies, Purdue worked with American Digital and HP Technical Services to upgrade both of the data centers on its main campus in West Lafayette. At each data center, the university deployed two HP BladeSystem c7000 Enclosures populated with HP ProLiant BL460c Server Blades and HP EVA8400 Storage. Everything is connected by HP Virtual Connect Flex-10 10Gb Ethernet Modules to ensure performance and throughput are optimized. The environment is 100 percent virtualized using VMware vSphere 5. Purdue standardized the operating system on Red Hat Enterprise Linux 5.0.

The two data centers are separated by about a mile and connected by fiber links. For redundancy, Purdue runs continuous replication between the two EVA8400 storage systems using the HP Continuous Access EVA Software. To back up its SAP environment, it implemented HP Data Protector, a software-based solution that uses the HP StoreOnce deduplication engine to minimize backup and recovery times.

To migrate the SAP environment from legacy software to Red Hat Enterprise Linux running on VMware, HP Technical Services brought in a contingent of SAP specialists. Over 12 weeks, the specialists migrated the SAP environment and worked with Purdue to ensure that the applications were running as expected. They also trained the hardware team to provision SAP systems in the new environment.

Customer solution at a glance

Hardware

- HP BladeSystem c7000 Enclosures
- HP ProLiant BL460c Server Blades
- HP EVA8400 Storage
- HP Virtual Connect Flex-10 10Gb Ethernet Modules

Software

- HP Data Protector
- HP Systems Insight Manager
- HP Insight Control
- HP Command View
- HP Virtual Connect Enterprise Manager
- HP Continuous Access EVA Software
- VMware vSphere 5
- VMware vCenter 5

Operating System

- Red Hat Enterprise Linux 5.0

Network Protocols

- 10 Gigabit Ethernet

HP Services

- HP Technical Services
- HP Factory Express
- HP Deployment

Smaller footprints means reduced power and cooling costs

One of Purdue's primary goals for implementing new hardware and virtualization for its SAP environment was to reduce power and cooling costs in the data center. It was also running out of space. "By implementing an HP Converged Infrastructure, we went from 16 racks of servers and four storage arrays down to three racks total across two data centers, including the storage," says Schumacher. In addition, by using the Virtual Connect Flex-10 modules, the university has reduced the number of cables required because it only needs four uplinks to connect each blade enclosure to its network. Not only has the university recovered space, but Purdue has also reduced power and cooling costs. Schumacher explains, "By reducing the hardware required for our SAP environment by more than 80 percent, we have also reduced our annual power and cooling costs by about \$51,000."

Backup and recovery times decreased by more than 50 percent

Today Purdue has reduced the time required for backups and restores in its SAP environment. Using HP Data Protector, Purdue can now take live snapshots of its SAP environment without having to take everything offline. "Taking live snapshots of SAP is extremely difficult, and HP Technical Services actually wrote code for HP Data Protector to enable these live snapshots," explains Williams. "The other benefit is that this code is now included in the general release, so other customers have access to it as well."

"With HP Data Protector, we can take a snapshot and clone our entire system without taking down the SAP environment, so users never lose access," says Evans.

The university can also update systems faster than it could in its legacy environment, again without having to take systems offline. Evans explains, "We recently applied an enhancement pack for SAP. As soon as we had upgraded our production environment, we were able to back it up using HP Data Protector and then run a restore to refresh the development and test environment with the updates. A process that used to take anywhere from two days to a week now takes less than half that time."

Standardized platform and virtualization help to ease administration

Purdue created a new virtualization management team to oversee its HP Converged Infrastructure and other virtualization efforts within the organization. "The team is no longer siloed into specific areas of knowledge," explains Schumacher. "Bringing them up to speed on Linux was much easier than trying to maintain different operating systems for different environments, and they are much happier supporting a single operating system."

With a unified team managing an infrastructure provided by a single vendor, people also know who to turn to when something goes wrong. "If we have a performance problem with one of our applications, I can talk to a group of people who know the infrastructure from top to bottom and can help me resolve the issue quickly," says Evans. "We also have one vendor who can help us review, diagnose, and resolve problems, instead of having to fit many pieces of a puzzle together to find a solution."

A virtualized environment also helps to ease administration because the hardware and application teams can more easily provision new servers when the university requires it. "If we suddenly have more demand for capacity or performance in our learning management system, or in our student information systems because registration is going on, we can dynamically add resources where we need them," says Evans.

To ease administration even further, Purdue plans to migrate the rest of its legacy VMware environment into its new converged infrastructure. "We have 22 physical servers and over 600 virtual machines that we plan to migrate over to our HP Converged Infrastructure," says Schumacher.

Increased performance of SAP applications by 50 percent

With SAP running on new hardware in a virtualized environment, parts of the university have seen significant performance improvements in applications they rely on regularly. "Our HR department runs payroll 50 times a year," says Evans. "Those payroll runs happen in half the time they took in our legacy environment."

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Because of the performance increases the university has seen in its key applications, it can operate more efficiently overall. The HR department can take the time it used to require to run payroll to complete other activities. For the IT department, this efficiency also means it can plan new projects to support the business.

Provides a cloud-ready solution to support other university IT departments

Purdue wanted to implement a converged infrastructure as a forerunner to offering private cloud services to other parts of the university. It plans to provide what it calls a federated virtualization model, which would enable it to share resources with other groups on campus. As departmental IT teams hear about the successful implementation in the campuses' main data centers, it seems the time for providing those services is fast approaching. "We have colleagues across campus asking to get into our data center so they can leverage our virtual infrastructure to offset their own," explains Schumacher. "With the help of HP, our next step is to determine how we can best provide cloud services to our IT colleagues."

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