HP and TriLogic deliver infrastructure flexibility to support the Pittsburgh Public Schools' virtual desktops anywhere, anytime

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As part of its mission to raise social and academic achievement to the Commonwealth of Pennsylvania's State Goal Standards for all students, the Pittsburgh Public Schools (PPS) planned to embed technology in the culture of the School District and local communities. The objective was to seamlessly integrate technology into the 35,000 students' daily schedules, making it as familiar a tool as a pencil and paper.

Demanding infrastructure flexibility
The PPS undertook planning for the creation of 40,000 virtual environments for students and teachers, which in turn created a demand for a highly scalable architecture to deliver virtual desktops anywhere at anytime.

Parallel to this effort, other application requirements were driving the need for a redesigned IT infrastructure. The catalyst for change came when the PPS launched its PeopleSoft Human Resources and Payroll application modules. IT staff witnessed how the legacy infrastructure failed to provide the system capacity or data storage required to permit the PPS to accomplish its goals for the implementation.

Elbie Yaworsky, Chief Technology Officer for PPS, elaborated, "We wanted an environment that was flexible – that did not have any physical, virtual or logical limitations. We wanted one cohesive environment that would provide us the flexibility to have a combination of blade server technology and multi-processor systems, and be able to dynamically allocate all available resources to specific applications when appropriate. We also desired to blend storage area network (SAN) drives and network attached storage (NAS) devices to achieve an optimal balance of price/performance. In addition, we needed to be operating system (OS) agnostic, to allow us to evaluate any application regardless of platform."

He set high-level goals, wanting the PPS' current application load to impose a utilization rate of no more than 30 percent on a new infrastructure, thereby allowing plenty of 'headroom' for the introduction of 40,000 virtual environments.

"Another driver for change came when we discovered a single point of failure in the legacy cluster. We uncovered the problem before the vendor identified it, giving us a loss of confidence in its ability to continue to meet our needs. We required any replacement infrastructure design to have no single points of failure, and provide 24x7 operation. We knew this would mean building in redundancy, but we also wanted to be able to optimally use all of our resources. Our goal was to have full access to the entire cluster once everything is available, but be able to run the entire application load on half the cluster in a 'fail-over' mode if necessary," explained Yaworsky.

Partnering with TriLogic and HP for success
The PPS brought in an independent consultant to help evaluate the available technologies from IBM, Sun and HP. The findings were in favor of HP. Yaworsky recalled, "We started leaning towards HP because its solution allowed the dynamic allocation of resources across a blended server environment, and the ability to bring up and down Microsoft® Windows and Linux servers in a rapid deployment mode."

He admitted it was HP's service and support expertise that clinched the deal, and noted, "The level of service we had experienced over the years – for the legacy HP desktops and servers that were in place – was excellent. We were very confident that the PPS would be well looked after by HP."

Based on the demographics of the district, it had a board-level mandate to engage with high-diversity suppliers. Working with best-in-class HP channel partner, TriLogic Corporation, fulfilled this requirement. TriLogic was given responsibility for the entire program – handling the project management and leading the engineering efforts.

It assigned a program manager who interfaced with configuration experts from HP.

At the conclusion of the design phase, the enterprise level proposal comprised: 122 HP ProLiant BL20p G2 blade servers as the web-access, front-end servers to the applications; 22 HP ProLiant DL580 servers to host five mission-critical applications; and the remaining key applications located on 23 HP ProLiant DL380 servers. In addition, a 6TB HP StorageWorks EVA Storage Array,

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two HP StorageWorks NAS e7000 Storage Drives, two HP StorageWorks MSL5060 Tape Libraries and 14 racks were selected. Services chosen included 152 Carepaqs, System Integration Services, HP Consulting, MAPS and Learning Paks.

Yaworsky reflected, "Both TriLogic and HP brought tremendous value. The sizing of the PeopleSoft environment was very critical and the HP partner team was involved in making sure the correct solution was being put in place. Additionally, implementing the right support services was critical for a truly successful enterprise-level computing environment – these included consulting, installation and break-fix services."

Simplified implementation steps
To simplify the implementation phase, TriLogic developed an engineering outline for assembly of the equipment. Using this document, HP pre-staged the 167 HP ProLiant servers – loading them into the racks, installing the storage disks, labeling and color coding the cabling – before shipping them to the school.

"The pre-staging was very important to us because of the limited size of our IT staff. When the equipment arrived, it only needed to be moved into the computer room and plugged in according to the color coded connectors – it was incredibly straightforward. The 'plug-and-play' delivery of our servers also leaves us in a good position if we should ever need to move half of the existing equipment to a remote site and provide immediate disaster recovery services to the entire enterprise," noted Yaworsky.

He continued, "Outside of the infrastructure implementation, we were three weeks behind in our PeopleSoft deployment, and the simplified installation of the new environment, as designed in collaboration with HP engineering and manufacturing, allowed us to catch up and get back on schedule."

The PPS recognizes that technology should not be regarded as a one-off capital event cost, but rather it needs to be part of ongoing operating costs. By establishing lease contracts with HP Financial Services, the PPS is assured that the technology will be regularly refreshed.

"HP Financial Services offered a strong, financially compelling lease. Not only did they win the business for the enterprise cluster, but they also won two separate multi-vendor desktop leases – totalling $13 million! HP has become our preferred leasing partner regardless of equipment source," declared Yaworsky.

Enjoying an agnostic operating system, highly available cluster infrastructure
Today, the PPS has in place a virtual, logical and physically highly redundant cluster that is operating system agnostic. While it is too soon to know if the virtual desktops will be Linux- or Windows-based, Yaworsky knows that the HP environment is highly flexible and able to support any of its targeted platforms and technologies. He observed, "It positions us for anything from .NET to open source. With the rapid deployment capabilities of HP ProLiant blade servers, we can switch from one operating environment to another very quickly during testing."

HP was able to build inherent disaster recovery capabilities into the cluster at the physical layer – taking full advantage of the speed of the wide area network (WAN) – which, in a disaster scenario, allows the PPS to remove one half of the total environment and move it to another site, to keep operational.

"Our new infrastructure is based on an enterprise management model enabling operational control of all resources from one remote console. Essentially, we've transitioned from a classic server lights-on environment to a lights-out data center – increasing the security, reducing power consumption and lowering operational overhead," noted Yaworsky.

Anecdotal evidence of improved performance includes a reduction from 12 hours to 39 minutes for the backup of the largest high school's systems – across a 100 megabit WAN versus a new one gigabyte network. Yaworsky said, "With the sophistication of the HP ProLiant blade servers and new storage, we can totally restore a disabled school server over our 1Gb wide area network within one hour, where it used to take days."

He concluded, "Our new HP server and storage infrastructure is extremely flexible. Being operating system independent allows us to evaluate new virtual environment software on functionality alone. We can quickly deploy whatever makes the most sense for the Pittsburgh Public Schools and eliminate less effective components. And, along with the adaptability of our new infrastructure, we know TriLogic is always here to support us in our goal to continue to utilize technology for educational excellence."

Challenges

- Required a scalable infrastructure across diverse systems and storage.

- Needed dynamic allocation of available resources across applications.

- Desired operating system (OS) independence.

- Wanted a 24x7, highly available architecture with built-in redundancy.

Solution

- Team with best-in-class HP channel partner, TriLogic Corporation, for project management and lead engineering services.

- Deploy HP ProLiant server infrastructure capable of delivering dynamic allocation of resources.

- Implement mixed HP StorageWorks data storage solutions for optimal cost/performance.

- Utilize consulting and support services from HP.

- Maximize budget via HP Financial Services leasing.

Results

- Three week project delay eliminated by efficient infrastructure deployment.

- The PPS is able to implement the most appropriate software regardless of operating system.

- Flexibility now exists to support the creation of 40,000 virtual environments anywhere, at anytime.

- Built-in high availability and disaster recovery keeps the infrastructure available 24x7.

- The lights-out data center has increased security, reduced power consumption and lowered operational overhead.

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