



The Pros and Cons of Self-Managed vs. Hosted Solutions

Executive Summary

- Higher education IT departments are being asked to do more with less
- What's needed is a dynamic and flexible IT infrastructure
- Institutions are using virtualization to simplify server and application management
- Some are turning to hosted solutions to offload IT equipment management

Higher education IT departments today must deliver 24x7 services and be nimble enough to roll out new applications as demand arises. And they must do all of this while dealing with tight budgets and in many cases a lean staff.

What's needed is a dynamic and flexible IT infrastructure that can support administrative and academic computing applications. The infrastructure must be scalable, as well as have characteristics and support features that help rein in costs.

To meet these criteria, many higher education institutions are adopting one of two strategies. They are either moving to an IT infrastructure that makes more efficient use of computing resources and thus one that is more cost-effective to run, or they are offloading many IT management chores by hosting applications on a service provider's infrastructure.

This paper examines these two approaches, identifying key benefits, shortcomings, and where cost savings can be realized.

New Technology Drives Self-Managed Choices Today

With the first approach, which will be called the self-managed approach in this paper, administration of all IT infrastructure elements (hardware, software, licensing, warranties, etc.) is

the sole responsibility of an institution's IT staff. Additionally, all data associated with the academic and administrative applications being run at the school must be backed up and safeguarded from unauthorized people.

For years, analyst firms including Forrester Research, Gartner, IDC, and others have noted the costs to maintain such IT infrastructures.¹ Specifically, there exist labor costs for the IT staff time needed to perform routine maintenance of equipment and applications, as well as the time to troubleshoot problems. Additional recurring costs include outlays for software licenses, warranties, and service contracts. And there also are operational costs for housing, powering, and cooling IT equipment.

Combined, these costs can add up to 75 to 80 percent of the total cost of ownership over a device's or application's lifetime.² (Acquisition costs account for the other 20 to 25 percent.) With budgets tightening due to the challenging economic conditions of the last few years, there has been a great emphasis on reducing such costs. The main technology being eyed to aid in this effort is virtualization.



1 "Total Cost of Ownership," Federal Electronics Challenge, September 26, 2007

2 "Track the True TCO," *Processor*, Vol. 25, Issue 39, September 26, 2003

**Infrastructure Choices at a Glance**

| | Upside | Points to consider |
|--------------|---|--|
| Self-managed | <ul style="list-style-type: none"> • Complete control of all aspects of infrastructure • Data maintained onsite for higher security • Flexibility to match specific hardware to each application based on compute requirements | <ul style="list-style-type: none"> • Management costs • Recurring fees for facilities, warranties, service contracts, and electricity • Space limitations as demands grow and servers are added |
| Hosted | <ul style="list-style-type: none"> • No acquisition costs • Offload equipment management to service provider • Highly scalable offering the flexibility to quickly meet new demands as they arise | <ul style="list-style-type: none"> • Extra effort required to secure data • Performance and service availability can vary • Provider longevity – what happens if they go out of business? |

In early 2010, *CIO Insight* reported³ that when it came to technology priorities for the year, virtualization ranked number-one among the 900 CIOs surveyed in an annual industry study. Quite remarkably, virtualization was not even in the top 10 in the previous year's survey.

The reason for the amplified interest: Using virtualization software, multiple applications can run on a single server sharing the server's computing resources. This allows institutions to consolidate the number of servers on which they need to run their applications. Running fewer servers translates into lower costs for management, service contracts, facilities, and electricity. And virtualization simplifies application deployment and management.

As such, virtualization is now being widely embraced for its ability to rein in costs. *CIO Insight's* 2010 technology trends survey⁴ of 211 CIOs and senior IT managers found that 71 percent have adopted virtualization, and 55 percent noted it was a key technology for cost reductions.

A 2010 *eWEEK* article⁵ hammered home this point quoting IDC analyst Brett Waldman as saying: "Virtualization is no longer the cool, unproven technology that people are looking into for quick cost savings. It has matured into an integral piece of the IT infrastructure."

Hosted Options Expand

The alternative to a self-managed IT infrastructure is to use a service provider to host your applications on their servers.

Here, the hosted environment offloads many of the management tasks to the third party providing the infrastructure. One great benefit of using a hosted approach is that scalability is easy to accomplish – an organization simply pays for more capacity as needed. And depending on the provider, organizations may be able to choose data backup and recovery services and service level agreements for system availability and performance.

One advantage of using hosted services is that they vary greatly, thus affording an institution many choices to match services with needs. Naturally, institutions must choose a provider that supports suitably strong encryption to ensure data is protected when traveling between a user's computer and the provider's systems. And the provider must demonstrate that its servers have the physical security necessary to protect private and confidential data.

The pricing for hosted services is based on computer resources used (e.g. CPUs, disk space, bandwidth, etc.), and many hosted service providers offer guarantees (for a price) on service availability and performance.

When choosing to host applications, there are several distinct choices available today.

First, there is a Software-as-a-Service (SaaS) approach. With SaaS, a provider runs the institution's applications on its (the provider's) servers. Common uses of SaaS include the hosting of an institution's e-mail, enterprise resource planning, or learning management system (LMS). In most SaaS deployments, the provider maintains the application.

A second approach is to essentially rent space on the provider's servers. For years, institutions have had the choice of sharing servers with other organizations, or running their applications on dedicated servers. (The shared approach typically costs less.)

Recently, a third option has emerged.

3 "Top 10 Tech Priorities for 2010," *CIO Insight*, March 17, 2010

4 "Emerging Technologies," *CIO Insight*, December 10, 2009

5 "Enterprises Thinking Virtualization First, IDC Says," *eWEEK*, April 28, 2010



Traditionally, while there was the flexibility to change capacity and services, hosting services were acquired through monthly or annual contracts. The new approach to offering services is based on cloud computing. With the cloud approach, an institution can rent CPUs, disk space, and bandwidth in small increments by the hour.

Service provider offerings of cloud computing services have been dubbed Platform-as-a-Service (PaaS). *CIO Insight* research⁶ found that of the roughly 200 CIOs and senior IT managers surveyed, 36 percent said they are already using PaaS, and another 30 percent are evaluating it.

Hybrid Approaches Likely

Regardless of the choice between self-managed and hosted solutions, some basic technologies can be used to derive benefits with both approaches.

For example, in a self-managed environment, virtualization can support a server consolidation effort, and it simplifies application deployment and management. Similarly, in a hosted environment where resources are charged for on a per-unit basis, virtualization allows for optimal use of CPU, memory, and storage.

Additionally, the cloud approach is increasingly being used within institutions. Such internal clouds run on a self-managed infrastructure and can aid in application availability. For example, an internal cloud allows a virtualized application running on one server to be seamlessly moved to another server. This allows routine maintenance to be performed without the need to take down an application. Additionally, when workloads increase and more CPU, memory, or storage resources are needed, a virtual instance of an application again can be seamlessly moved to a server with low utilization to provide the needed capacity to keep response times up and users happy.

Furthermore, adopting a cloud approach also makes it easier to move applications from a self-managed to a hosted environment. Essentially, the same features that allow virtual application instances to be moved internally on a private cloud can

be leveraged to move the instances to a third-party provider's cloud infrastructure.

One indication of the level of interest in using cloud technology both on internal and public networks is the growth in higher-end virtual server management software. Such software enables the dynamic movement of virtual instances of applications from server to server. A 2009 *eWEEK* article⁷ noted the increased use of virtualization technology for core applications was driving the use for virtual server management software – software whose revenues IDC estimates will grow by 23 percent over the next few years.

Dell as Your Technology Partner

Dell offers a wide variety of high-performance virtualization platforms, software, and services customized for your higher education institution. The solutions can be used to support a self-hosted infrastructure as well as tap the benefits of a virtually hosted environment.

Dell works with hardware industry partners and software virtualization leaders to offer a complete virtualization solution. Dell also has extensive partnerships with systems and data management solutions providers to offer myriad options and flexibility so institutions can use the management solutions of their choice.

Specific to the higher education market, Dell delivers academic computing solutions designed to provide students, faculty, and administrators with around-the-clock communication, collaboration, and access to information both on and off campus. To that end, a Dell LMS includes curriculum management systems, messaging and collaboration infrastructure, distance learning solutions, and robust classroom technology including digital whiteboards.



To learn more about Dell's higher education solutions, visit www.dell.com/highered

6 "Cloud Computing, Mobility Gain Focus for 2010," *CIO Insight*, December 10, 2009

7 "Enterprises Thinking Virtualization First, IDC Says," *eWEEK*, April 28, 2010