Success Story

University of Tennessee Knoxville Boosts Competitive Edge with Citrix Virtualization on FlexPod

KEY HIGHLIGHTS

Industry
Higher education

The Challenge
Support anywhere, anytime student computing environment while conserving IT and financial resources.

The Solution
Build application and desktop virtualization delivery system with Citrix based on the FlexPod® data center platform from Cisco and NetApp.

Benefits

- Enables students and faculty to learn and teach anytime, anywhere, on any device
- Cuts costs while increasing IT services
- Enhances competitive edge in higher education, where technology is a key differentiator

Customer Profile

The University of Tennessee (UT), Knoxville, is one of the oldest public universities in the U.S. It started off as Blount College in 1794, before Tennessee became a state. In 1879, the state legislature changed its name to the University of Tennessee and expanded it. Today, UT attracts some of the state's best and brightest students, resulting in a significant rise in academic qualifications and higher graduation rates. Today, with 28,000 students, UT is the largest land-grant institution in Tennessee.

The Challenge

Tighter budgets, growing demand

In higher education, information technology (IT) has become essential to attracting and retaining students. Although many public universities have had to pare down their budgets, the expectations for the latest technologies—cloud-based computing, high-quality streaming video, high-end research software—continues to rise, making it necessary to provide more IT services more affordably.

In response, UT Knoxville has continuously advanced its IT resources to meet demands, such as delivering around-the-clock access to applications and data for approximately 27,000 unique users. Just two staff members are responsible for the overall Labs/Systems IT infrastructure, student computing, Web mail, and database servers, as well as mission-critical business and administration systems such as SAP®.

Make key applications available outside the lab

Until recently, most student computing activities, including research, were limited to 36 computer labs across campuses. The labs had 1,200 desktops and generated 8 terabytes of data. Applications were often tied to specific labs and locations.

Although most students and faculty today own their computing devices, an average of 27,000 users per year still frequent the labs, where students gain free access to specialized software that would cost them hundreds or thousands of dollars to purchase. UT Knoxville wanted to deliver remote access to applications such as Hyper Chemistry, MATLAB, SAS, Mathematica, and Stata. Other frequently used software includes Adobe Creative Suite, ArcGIS, AutoDesk, and Microsoft® Office.

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IT Systems Administrator

"We wanted to virtualize and stream dozens of applications to thin client and end-user desktops online, supporting our lab users remotely," explains Wojciech Biernacki, IT systems administrator at the University of Tennessee, Knoxville. "Essentially, we are transforming dorm rooms, libraries, and common areas into computing labs to allow students to engage in learning whenever and wherever they prefer."

The university needed to address other important goals as well, including expanding access to IT resources while reducing overhead, gradually decreasing software licensing costs, and supporting the trend of people using mobile devices for nearly every facet of learning, teaching, and administration. Already, UT Knoxville supports 22,500 varied wireless devices accessing the campus network.

Do more with less

In addition to the lab machines, IT manages roughly 10,000 additional machines across five campuses and supports numerous operating systems, including Windows®, Mac® OS X, Linux®, Solaris, iOS, and Android. Because the number of devices across campuses and in 100 field offices has continued to grow while the staff to service them has been cut in half, keeping machines available and updated with the latest operating systems and software was becoming increasingly burdensome. Adding to the challenge, custom requests to provision dedicated IT systems for new projects are common, and must be accommodated quickly to hasten promising research or meet other demands.

The Solution

A unified computing system enabling remote access

UT Knoxville began by providing remote access to the most vital lab-based research software through Apps@UT, an application and desktop virtualization delivery solution. The foundation of Apps@UT is Citrix XenApp and XenDesktop and Provisioning Server (PVS) built on FlexPod. A data center platform that delivers a flexible, shared infrastructure from NetApp and Cisco, FlexPod offers a compact and reliable yet powerful foundation for Apps@UT.

According to Biernacki, students largely drove the effort. "The students on UT Knoxville's Technology Advisory Board were the visionaries driving the Apps@UT program, believing it will give all university students the high degree of flexibility and availability they have come to expect from technology today," he says.

Building the Apps@UT flexible, shared IT infrastructure

After a comprehensive evaluation, UT Knoxville chose Citrix XenDesktop and XenApp based on eight years of positive experience with the technology and exceptional Citrix support for all variations of mobile and desktop clients. Citrix also enabled a blended delivery strategy that encompasses physical desktops; virtual desktops, currently in a limited pilot in IT; and XenApp to support published applications that run across 1,200 virtual machines. As a result of this blended delivery model, UT Knoxville has a range of options to support mixed workloads and satisfy a variety of use cases.

The university chose FlexPod due to its clean, compact design and high performance, as well as coordinated services among vendors. "Our executives loved the simplicity and power of the integrated stack in FlexPod," says Biernacki. "And for IT, the prevalidated architecture with prescriptive sizing and design guides reduced our risk in deploying an entirely new and more advanced data center architecture."

The FlexPod configuration deployed by the university includes NetApp® FAS6210 storage systems; Cisco® Unified Computing System™ (UCS™) B200 M2 servers, some with 48GB of RAM, others with 96GB of RAM; as well as a wide range of Cisco Nexus® 7000 series switches. As part of the FlexPod solution, the NetApp Unified Storage Architecture enables UT

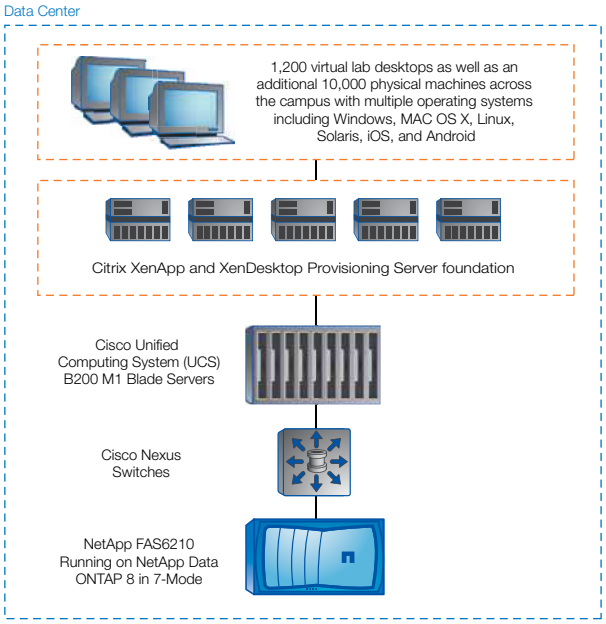

Figure 1) UT Knoxville provides remote access to the most vital lab-based research software through Apps@UT, an application virtualization and delivery solution. The foundation of Apps@UT is Citrix XenApp. XenDesktop, and Provisioning Server built on FlexPod. A data center platform from NetApp and Cisco that delivers a flexible, shared infrastructure, FlexPod offers a compact and reliable yet powerful foundation for Apps@UT.

Knoxville students and staff to store and access their virtual desktop and user data from all university-owned and personal devices. Additionally, the high-availability features in the NetApp platform deliver 24/7 access to virtual desktops and automatically back up student data. NetApp SnapMirror® technology replicates data to a secondary system in active-active mode, with plans to utilize SnapVault® technology in the future. The university also relies on NetApp deduplication technology to reclaim storage space and avoid unnecessary costs.

Business Benefits

Anytime, anywhere learning and mobile accessibility

Apps@UT has currently rolled out application virtualization to 1,200 lab machines across the university, allowing students to access key research and other applications using their own preferred devices from virtually anywhere—dorm rooms, libraries, and other locations. The university is also piloting hosted, virtualized desktops within IT, with plans to expand to other departments and units.

The system is so flexible and powerful that its use is expected to expand university-wide, across all five campuses. Currently, a successful pilot project to virtualize SAP with Citrix technologies on FlexPod is in progress. The FlexPod systems are also used for Active Directory® as well as a development environment for Systems and Computer Technology Corporation Banner and Microsoft SharePoint®.

The university also is well prepared to embrace the ever-increasing bring-your-own-device trend. Faculty and students are better served because they can log in online to assign or complete assignments from anywhere, at their own convenience, instead of going to a dedicated lab.

Significant IT resource and cost savings

Today, managing far-flung computing labs takes far less time and fewer resources than before, and an even more powerful infrastructure can be managed with a staff of two, half as many administrators as previously required. XenDesktop and XenApp, in concert with the PVS provisioning capabilities, simplify virtual desktop lifecycle management processes and have driven down the cost of ownership through central management of application updates and simplified, accelerated delivery of virtualized applications.

Staff can simply create a standard image to meet the use case and supply it to various locations, without having to travel to facilities to install software on individual desktops. The upshot is lower costs and overhead and the ability to deliver cutting-edge IT solutions rather than spend time maintaining the current infrastructure.

Cost savings and better service for students

The FlexPod platform and Citrix technologies are reducing costs in other ways as well. The Apps@UT infrastructure now consumes a fraction of data center space and power, and the IT team is reclaiming a significant amount of storage space. General virtualization volumes saw dedupe rates of 40%. The upshot is the ability to avoid purchasing additional storage space before it is required.

Reliability is also on the rise. “Citrix and FlexPod are so incredibly flexible and modular that if we have an issue such as a fan or a power supply going out—an extremely rare occurrence—we can remedy it with no downtime,” says Biernacki. “We routinely get compliments from students that our computer labs are much more responsive and stable than others they’ve used in the past.”

Faster responsiveness to student and faculty needs

When a professor needs to provision IT resources for a new project, it used to take days or weeks, but now can be accomplished in hours—even minutes in some instances. The need to scale server

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power or storage—up or out—can be accommodated swiftly with FlexPod.

"In IT, we can now say 'Yes' when asked to do what used to be impossible. It makes us proud because we can cost-effectively deliver a higher level of IT services—an important factor in sustaining our competitiveness and building a successful learning environment for students," concludes Biernacki.

SOLUTION COMPONENTS

FlexPod Components
NetApp FAS6210 storage systems
Cisco Unified Computing System (UCS) B200 blade servers
Cisco Nexus 7000 series switches
Cisco Nexus fabric extenders
Data ONTAP® 8 operating in 7-Mode

Virtualization Components
Citrix XenApp
Citrix XenDesktop
Citrix Provisioning Server

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SnapMirror

Protocols
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