

# Norwich University Consolidates Data Center and Storage, Gains Nearly \$1.2 Million in Benefits with Complete HP Solution

## IN BRIEF

- **Goal:** For Norwich University to consolidate its data center, increase and virtualize available storage, provide for off-site server/storage management, and provide robust, redundant and reliable access to computing resources 24 hours a day, seven days a week.
- **Solution:** A SAN based on the Hewlett-Packard StorageWorks Enterprise Virtual Array (EVA5000 system), fused with NAS (Hewlett-Packard NAS 4000); and the award-winning, Hewlett-Packard ProLiant blade servers
- **Results:** A projected, cumulative five-year net benefit of \$1,162,271, driven by savings in support costs, the ability to provide services without downtime, and avoiding having to buy expensive, directly attached storage. An ROI of 487% and a payback period of 12 months.

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Norwich University was using aging, single-purpose servers with direct-attached storage for its staff and 1,900 students. The system had excessive downtime, its storage was inadequate, it was incapable of supporting a disaster recovery plan, and it was expensive to maintain and grow. Additionally, the university had expanded by adding an online graduate program that placed further strain on student administrative systems and communication services and were often unavailable because of system troubles. To solve the problem, Norwich University turned to HP for a complete solution, including EVA and NAS storage and blade servers. The result has been increased availability, a reduction in support costs, and an infrastructure that can be easily expanded and can serve as the foundation for a disaster recovery plan. The solution will yield a projected, cumulative five-year net benefit of \$1,162,271, with an ROI of 487% and a payback period of 12 months.

NOTE: This case study was authored by the Case Study Forum. The Case Study Forum is dedicated to writing and publishing case studies for the IT community.

## Benefits

Objective	Benefits Achieved
Increase system availability and uptime	Since the new system has been installed, availability has increased by a factor of ten. Additionally, there is no longer a single point of failure in the infrastructure of the server farm, and the system is far more stable and less prone to crashes.
Support 24-by-7 availability	Since the new HP architecture has been in place, there has been no downtime in core Active Directory, external Web services, student ERP application servers or critical infrastructure for the server racks (power, network or management functions).
Expand available storage without increasing support costs	By installing the HP EVA-based SAN and NAS systems, Norwich is able to make better use of existing storage via virtualization, and can support additional terabytes without adding to staff or support costs, for a projected savings of nearly \$1.1 million over five years.
Launch new projects and expand infrastructure quickly	Norwich University can now quickly add new applications and services far more quickly than before. It was able to extend its Citrix infrastructure in only four hours; previously that would have taken three weeks.
Build a foundation for a disaster recovery plan	The new HP ProLiant blade servers combined with the HP StorageWorks system allow Norwich University to build a comprehensive backup and disaster recovery plan.

## **About Norwich University**

Norwich University, a private university based in Northfield, Vermont, combines a military tradition of nearly two centuries with a broad range of traditional undergraduate degree programs. It was founded in 1819 as the first private military college in the United States and is the birthplace of the nation's Reserve Officers' Training Corps (ROTC) program. Approximately 1900 students are enrolled, and the students are a mix of a Corps of Cadets and traditional students. Norwich was the first private college in the United States to teach engineering, offers 30 academic programs, and has a 14-to-1 student-to-faculty ratio.

## **The Challenge: Update an Aging Infrastructure, Increase Storage, and Support 24-by-7 Online Classes**

To better deliver educational services, Norwich University embarked on long-range strategic planning around its IT infrastructure. It had multiple single-purpose servers, each of which was responsible for handling a single application, and had its own direct attached storage. A number of those servers were at the end of their life cycle, and were no longer being supported, yet they were running mission-critical applications.

This inefficient architecture led to a variety of problems. All storage was server-attached, and available only to its own server, and was not available to any other applications or servers. So even though the university had multiple terabytes of storage, it had problems with storage space, because it could not reassign storage from application to application on an as-needed basis.

Similarly, because servers were used for single applications, they could not be reconfigured so that more computing power could be applied to one application, while taking away computing power from an application that did not need as much.

These issues, when combined with aging servers, led to excessive downtime, and applications and storage were not always available when students and staff needed them. In response, individual departments had created "shadow" systems which they used to pull critical data from servers, and stored the data locally. Faculty were printing information and using printouts for coursework, and staff were resorting to manual processes rather than automated ones – a significant waste of time and resources.

At the same time, Norwich University had launched an online graduate program which enrolled, among others, military personnel serving in Iraq. Online programs require 24 hour, seven-day-a-week availability, but because of aging servers and an outdated infrastructure, community resources were not always available when students needed them.

Additionally, there was no easy way to add storage capacity. It could only be added on a server-by-server basis, which was inefficient and costly, and led to increased maintenance costs. Norwich University was also having to spend significant amounts of time maintaining and patching hardware and software because its servers were from a variety of different vendors.

## Driving the Need for a New Solution

Norwich University was looking to find a new infrastructure solution that would accomplish the following goals:

- **Increase available storage without adding to staff.** The university recognized that its storage needs would grow, and that direct-attached storage would not be capable of meeting those needs. It needed some way to handle storage more flexibly, so that it could be quickly applied to areas with the greatest needs. But it did not want to have to add to staff to handle the increased storage.
- **Add flexibility to the infrastructure.** Because servers were used for single applications, it was time-consuming, costly, and difficult for Norwich to install new applications, change its infrastructure, or add new features and services. It wanted to be able to make changes much more quickly than it was capable of doing.
- **Increase availability.** Downtime had become a nagging problem at the university. Staff and students were not always able to access computing and educational resources.
- **Simplify system maintenance and support.** Norwich University had a wide variety of hardware from many different vendors, including aging Digital Equipment minicomputers. It had to go to numerous sources for support, and had a difficult time maintaining such a diverse set of hardware.
- **Retire old hardware.** Norwich University's servers were aging, and some were out of their service contracts. The university needed to modernize its hardware to meet its current and future computing needs.

**"Our current infrastructure simply wasn't working for us. It was aging, suffered from excessive downtime, difficult to maintain, and wasn't meeting the needs of the students or faculty."**

STEVE BRAUTIGAN  
CIO  
NORWICH UNIVERSITY

- **Lay the foundation for a disaster recovery plan.** The infrastructure problems made it difficult for Norwich University to design a comprehensive disaster recovery plan.

## **Norwich University Chooses the HP Solution**

**Norwich University chose HP because HP was the only vendor that supplied a complete end-to-end solution from SAN to servers, to tape drives in an integrated fashion, and without having to resort to expensive consultants for installation and implementation.**

In planning out a new infrastructure, Norwich University realized that an EVA-based storage area network (SAN) would be an ideal solution, because it would allow the university to virtualize its storage and assign the storage on an as-needed basis to applications and servers. It also believed that a SAN would offer significantly better performance and higher availability than its current system. The university also wanted to standardize on servers from a single vendor, to cut down on the problems the IT staff faced in having to maintain and troubleshoot servers from multiple vendors.

It chose HP for the complete solution, including HP ProLiant blade servers, the StorageWorks Enterprise Virtual Array (EVA 5000), and a Hewlett-Packard NAS 4000. It chose HP because HP was the only vendor that supplied a complete end-to-end solution from SAN to servers to tape drives in an integrated fashion, and without having to resort to expensive consultants for installation and implementation.

## **The Bottom Line for Norwich University**

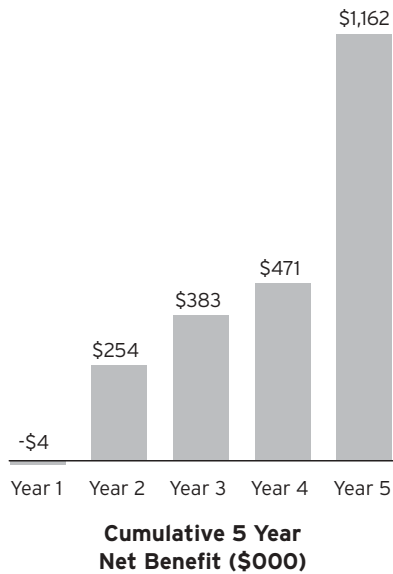
**Norwich University's bottom line for the project: A projected, cumulative five-year net benefit of \$1,162,271, an ROI of 487%, and a payback period of 12 months.**

A detailed analysis of the implementation shows that Norwich University will gain a projected cumulative five-year net benefit from the project of \$1,162,271. The project will have an ROI of 487% and a payback period of 12 months.

The benefit is made up of savings in IT support, increased revenue from academic programs resulting from having appropriate technology available to faculty and students when they need it, and avoiding having to buy additional server-attached storage.

Norwich University will save a projected, cumulative \$1,095,371 over five years in IT support costs because the HP solution allows the existing IT staff to support greater amounts of available storage, and more easily maintain and troubleshoot servers. IT staff can now call a single vendor, rather than multiple vendors, when they run into problems. System administrators are able to spend more time working on projects and handling growth, and less time on maintenance and troubleshooting problems. The solution has also allowed Norwich University hold down the growth of its IT staff.

Norwich University will also save a projected cumulative \$1.8 million over five years in avoiding having to buy additional server-based storage. The HP SAN solution allows the university to dynamically configure storage on an as-needed basis, and it can more efficiently assign storage to applications. No storage is wasted, as it is with server-based storage, and the university can buy less storage to serve its needs.

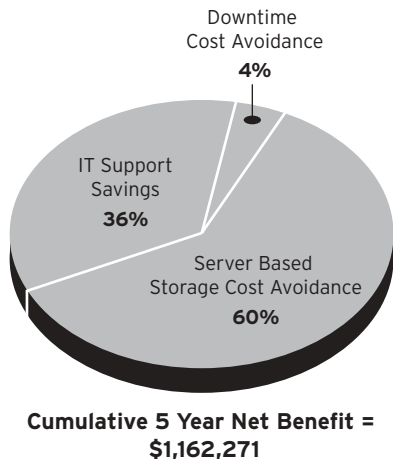


Since the new system has been in place, overall availability has increased by a factor of ten. Before installation, its critical applications went down on an average of once per week, but the changes in infrastructure has increased availability into the four 9's, with five 9's on the horizon with changes in critical application architecture. Additionally, there is no longer a single point of storage failure for application data, and the system is far more stable and less prone to crashes. The university is now creating the foundation for a complete disaster recovery plan.

The university will also save a projected cumulative \$113,900 over five years because its core services will be always available. Because the support infrastructure will always be available, more students will attend, leading to an increase in tuition payments.

The new solution also enables Norwich University to more quickly install new applications and services because of the flexibility of the blade servers and the storage solution. For example, after it installed the new solution, it wanted to grow its Citrix infrastructure for interoperability and telecommuting. It was able to quickly reconfigure hardware, and launch the new Citrix infrastructure in four hours. Previously it would have taken three weeks.

The following chart provides a detailed, five-year analysis.



Project Summary	
ROI	487%
Payback Period (in months)	12
Cumulative Net Value	\$1,162,271

Project Costs (000)	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5	Total
HP Solution Licensing Fee	\$300	\$300	\$300	\$390	\$507	\$0	\$1,797
Training	\$0	\$10	\$10	\$10	\$10	\$10	\$50
<b>TOTAL PROJECT COSTS</b>	<b>\$300</b>	<b>\$310</b>	<b>\$310</b>	<b>\$400</b>	<b>\$517</b>	<b>\$10</b>	<b>\$1,847</b>

Benefits (000)	Year 1	Year 2	Year 3	Year 4	Year 5	Total
IT Support Savings	\$106	\$139	\$200	\$276	\$372	\$1,095
Downtime Cost Avoidance	\$0	\$28	\$28	\$28	\$28	\$113
Server Based Storage Cost Avoidance	\$500	\$400	\$300	\$300	\$300	\$1,800
<b>TOTAL BENEFITS</b>	<b>\$606</b>	<b>\$568</b>	<b>\$529</b>	<b>\$605</b>	<b>\$700</b>	<b>\$3,009</b>

Financial Analysis (000)	Start Up	Year 1	Year 2	Year 3	Year 4	Year 5
Net Value	-\$300	\$296	\$258	\$129	\$88	\$690
Cumulative Net Value	-\$300	-\$4	\$254	\$383	\$471	\$1,162
Net Present Value						\$903
Payback Period (in months)						12
ROI						487%
Internal Rate of Return						83%

## Norwich University Looks to the Future

**“With the new solution, we can change directions at the drop of the hat. It makes it easy for us to offer whatever the university needs in order to attract and retain students, and help our existing students thrive.”**

STEVE BRAUTIGAN  
CIO  
NORWICH UNIVERSITY

With a stable, flexible infrastructure in place, Norwich University can more easily adapt to a changing educational landscape, without having to buy additional hardware or hire additional IT staff. It can grow its online graduate program. And because it can quickly add new applications and services, it can continue to attract new students and retain its existing ones.