Colorado College needed to replace a storage infrastructure that was routinely causing major disruptions to campus information systems. The choice of Pure Storage has delivered significantly improved reliability and uptime, the freedom to add new/consolidated workloads as needed, and dramatically reduced storage-management demands.

COLORADO COLLEGE

BUSINESS TRANSFORMATION

Students, faculty and staff have faster, more reliable access to the applications they regularly use, while a radically simplified storage platform frees the IT staff to focus on higher-value activities.

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"With the Pure Storage array, we can clone databases as much as we want with no performance hit and no impact on capacity."

Andrew Watson,
Senior Systems Administrator

COLORADO COLLEGE'S COMMITMENT TO IMAGINATION EXTENDS TO MODERN STORAGE FROM PURE STORAGE

At Colorado College, thinking differently is a way of life. The college uses a unique "Block Plan" for learning, in which students enroll in a single 3-½ week course at a given time rather than take several courses simultaneously throughout a semester. The college emphasizes close interaction between students and faculty, with an enviable ratio of about 200 faculty to 2,000 students.

Colorado College's creativity also extends to its use of information technology. It was an early adopter of virtualization technology, and recently completed a renovation of its library to add innovative features such as a "Tech Sandbox," where students can experiment with new technologies, and a multi-disciplinary graphical information systems (GIS) lab.

Virtually all campus functions run on the Ellucian Banner enterprise resource planning (ERP) platform, using Oracle databases, hosted by some 300 virtual servers running on VMware vSphere. An ongoing initiative is replacing terminal services delivered over a VPN with a virtual desktop infrastructure running on VMware Horizon.

CRITICAL APPLICATIONS LEFT VULNERABLE BY STORAGE

In early 2014, the college determined its storage infrastructure was threatening to turn IT from a valuable learning tool into an impediment. "We started to experience a lot of drive failures with our SAN," recalled Andrew Watson, senior systems administrator at the college, "and those failures would cause the storage array to disconnect from the VMware ESX hosts. So, every time a drive failed, it would cause our entire virtual infrastructure to crash — which is 99% of our workloads."

Noting that "a day's worth of content on the Block Plan is like a week's worth of content on a semester plan," Watson said "we have little tolerance for downtime; system availability is a high priority. When our legacy storage was crashing everything, it attracted the kind of attention you don't want."

Watson said the college "never got clear resolution from the vendor why the crashes were happening, so we decided we had to get away from spinning disk and move to flash storage."

The college's IT team researched flash-based storage vendors and invited several to participate in a testing program focused on its No. 1 requirement — resiliency. "We put

COMPANY:

Colorado College
coloradocollege.edu

USE CASE:

- Virtual Server Infrastructure – VMware® vSphere®
- Virtual Desktop Infrastructure – VMware Horizon®
- Database – Oracle®

CHALLENGES:

- Disk failures regularly caused a massive disruption of campus IT systems.
- Legacy storage required constant attention from IT staff.

IT TRANSFORMATION:

- All-flash array delivers rock-solid reliability, eliminating disruptions to key applications.
- Multiple, diverse workloads run simultaneously, supporting more applications with no added cost.
- IT staff spends virtually no time managing storage, refocusing attention to high-priority initiatives.

> "The Pure Storage array handles all these diverse workloads simultaneously without breaking a sweat."
>
> Andrew Watson,
> *Senior Systems Administrator*

all the boxes through the same level of testing for different failure scenarios, and the last one standing was the Pure Storage array. So, we bought the array they had installed for the tests."

CONSOLIDATING KEY APPLICATIONS ON ALL-FLASH

Moving data and workloads onto the Pure Storage array took little effort. "All we had to do was vMotion storage from one device to the other. It was very easy."

During the migration, the effortless management of Pure Storage arrays became apparent to Watson. "The management interface is so simple and intuitive," he observed. "I went in there for about five minutes and set up the LUNs, and that was the last time I had to do that. Once they were presented to VMware, there wasn't much management left to do.

"All of our previous storage systems required so much learning, like a six-day class on how to set up and manage a SAN — as opposed to Pure Storage, where you just look at a screen and figure it out in a minute, and you're done. That's a huge advantage."

On top of improved resiliency, a welcome benefit of the Pure Storage array has been a significant improvement in performance across multiple dimensions.

College staff regularly run reports and business-intelligence analysis off the Oracle databases supporting Banner, "and it was taking an exceedingly long time to submit some of those queries," Watson noted. "After the Pure Storage array was installed, many of the users said, "wow, this is much better'."

Every night, a large data warehouse is refreshed to reflect changes made to finances, student records, applications, fund-raising and other critical functions. "This used to take more than 12 hours to complete, and now it is finished in less than six hours," Watson reported.

Response times in the campus computer labs also have improved significantly. "The applications have become notably faster, based on the feedback we have gotten," Watson said. "Students don't have to sit around and wait for their session to start up like they used to. Everything is much more responsive."

The reliability and performance of the Pure Storage array allowed the college to embark on its VDI initiative, and the first users were the software-development teams, who have been unusually busy as the college prepares to upgrade to a new version of its Banner ERP. "Our developers have very demanding requirements, and they were hesitant to give up their individual desktops. But with the VDI running on Pure, the performance has been exceptional, and the response from developers has been overwhelmingly positive."

EFFORTLESS BACKUP ENSURES BUSINESS CONTINUITY

Especially beneficial has been the cloning features of the Pure Storage array. "In the past, it would have taken us a long time to make a clone of a database," Watson said, "but now it's almost instantaneous; less than a minute to clone a large database so the developers can test their work."

Another valuable use of the Pure Storage cloning capabilities is in backup procedures. "We take snapshots before, during, and after upgrades of our production databases using vRealize Orchestrator to batch schedule copies," Watson said. "We move a copy of the snapshot onto tertiary storage, and the developers can resume their work in just minutes.

"The biggest benefit of Pure Storage is that I can sleep at night again."

Andrew Watson,
Senior Systems Administrator

"We never used snapshots with our previous SAN because it was too complicated to use. But with the Pure Storage array we can clone databases as much as we want with no performance hit and no impact on capacity. And the vRealize interface on the Pure array streamlines the process even further."

Another valuable feature of the Pure Storage array is its in-line data-reduction capabilities. "Pure had the best de-duplication and compression of any product we tested," Watson said. "We initially said we'd be happy with 3:1 reduction, but we are averaging 7:1 across all workloads, with as much as 10:1 on the VDI." The high data-reduction ratios "mean I can put a lot more on the array than I thought I could, and that will save us money since we don't have to endure major upgrades in the near future."

Watson's sole objective in buying new storage was to solve the reliability problem impacting the virtual server infrastructure, so the ability of the Pure Storage array to handle multiple, diverse workloads concurrently has been a pleasant bonus.

"We always assumed we would have to buy separate storage for our VDI," said Watson. "But we have continued loading more and more onto the //M20 and still have plenty of capacity remaining. It handles all these diverse workloads simultaneously without breaking a sweat."

SIMPLIFYING THE ENTIRE STORAGE INFRASTRUCTURE

With the college's legacy storage system, "I was fighting storage all the time, and it was taking up a lot of my time. Now, I don't spend any time with it, other than the occasional upgrade. This gives me the time to spend on high-priority projects, like our VDI."

Watson is an enthusiastic user of the Pure1™ management interface, which he deploys as an app on his smartphone. "I never log into the console interface anymore, because I can just look at my phone and see everything I need to know," he said. "That has been so convenient. Plus, it's comforting to know that if the need arose, I could just tap on the app and I'd be in contact with someone immediately."

On the rare occasions he has contacted Pure Storage for support, his experience has been "consistently excellent." That includes the time he upgraded from the FlashArray originally purchased to the //M20 the college uses now — a process that was accomplished during weekday business hours with no interruption to operations. "I had trouble believing Pure's claim of nondisruptive upgrades until I saw it firsthand."

The college subscribes to the Pure Evergreen™ Storage program, which guarantees customers nondisruptive access to the latest technology while preserving prior investments. It allowed the college to upgrade to the //M20 sooner, and at lower cost, than would have been possible with any other vendor's maintenance plan. "Evergreen is a big plus for Pure Storage, and it has gone over very well with our finance people."

In summarizing his experience with Pure Storage, Watson cited performance, flexibility and effortless management. But the most valuable benefit from Pure, he concluded, "is that I can sleep at night again."

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