The Colorado Department of Education (CDE) is responsible for Colorado's 178 school districts and 1,836 schools, as well as nearly 900,000 public school students. CDE employs 56,000 teachers and 2,800 school administrators and is responsible for providing services to cooperative education services, early learning centers, state correctional schools, state libraries and other educational programs. When an aging storage system started to slow the performance of those Web services, the department moved to a Pure Storage FlashStack™ converged infrastructure resolving the performance problems and greatly simplifying IT administration.

BUSINESS TRANSFORMATION

Educators and administrators have fast, reliable access to information and tools needed to do their jobs effectively. The IT department gets a more productive infrastructure for its money, spends far less time on infrastructure management, and has a clear, standardized, highly cost-effective growth path for future IT services.

GEO

North America

INDUSTRY

State Government

"Having a FlashStack architecture makes it easier and faster to spin up new VMs and is infinitely easier to manage."

Steve Berryman, ***infrastructure manager***

PURE STORAGE FLASHSTACK INFRASTRUCTURE GETS STRAIGHT A'S FROM COLORADO DEPARTMENT OF EDUCATION

The Colorado Department of Education (CDE) supports more than 1,800 schools in 178 districts throughout the state of Colorado. The department offers information, tools and programs about a wide range of topics of importance to teachers and administrators. This includes curriculum, standards, training, test scores, educator effectiveness and professional development.

Some 56,000 teachers and 2,800 administrators use the department's website to download data and tools, and to upload information such as test scores and school statistics. CDE has an Identity Management process that simplifies and streamlines the user login process for CDE data systems and enhances security to student-level data. About 8,500 of these sessions are handled daily.

About three-quarters of the department's IT activity is outwardly focused, mostly toward teachers and administrators, with the remainder targeted at internal activities of the department.

"We operate a big data-gathering effort with all the end-points we serve," noted infrastructure manager Steve Berryman, who oversees compute, network and storage resources for the department at its Denver offices. "The performance of our Cisco Web servers is crucial to providing educators the resources they need to effectively serve their students."

Berryman is a pioneering designer of "converged infrastructures," which combine compute, storage and networking functions in a single chassis. He is intimately familiar with the advantages of combining UCS blade servers and networking products from Cisco Systems together with storage systems and VMware virtualization software.

So, when Berryman needed to make major enhancements to his IT infrastructure, he knew he wanted a converged infrastructure similar to one he had created during his tenure at another office of state government. Although some vendors had converged-infrastructure offerings, Berryman found them too expensive, and too complex to configure and manage. "Their complexity negated many of the benefits you want from a converged infrastructure, like effortless installation and management, greater reliability, and a non-disruptive path for accommodating growth," he noted.

COMPANY:

Colorado Department of Education
www.cde.state.co.us

USE CASE:

- VSI – VMware® vSphere®
- VDI – VMware® Horizon®

CHALLENGES:

- Inadequate infrastructure performance, particularly storage performance, put restraints on application and service delivery.
- Legacy systems were nearing end of life, necessitating replacement.
- Data reduction from an earlier flash system failed to meet promises.

IT TRANSFORMATION:

- Services can be deployed faster, without performance concerns.
- Data-reduction of 4:1 allows reduction in data-center space.
- Evergreen Storage capabilities creates a clear growth path with predictable expenditures.

> "Pure Storage came in with a lower price, they had 10TB more capacity, their data-reduction rate was much higher, and they had an awesome lifecycle-management story."
>
> Steve Berryman, ***infrastructure manager***

That's why Berryman went with what he knew would work to achieve the converged infrastructure that the department needed. Specifically, he deployed UCS servers and Nexus switches from Cisco, VMware software, and a Pure Storage FlashArray//m20. Having determined that all-flash arrays were his choice for new storage equipment, he took full advantage of the FlashStack converged infrastructure design from Pure Storage, which speeds time to deployment, lowers overall IT costs and reduces deployment risk. Providing fully-tested converged infrastructure reference designs, FlashStack solutions are now sold by authorized resellers of Cisco and Pure Storage products.

FLASHSTACK CONFIGURATION SOLVES MULTIPLE PROBLEMS

Berryman noted a number of benefits from having a FlashStack infrastructure. "It's much faster to spin up new VMs. It is more stable and reliable. And it definitely is easier to manage. It takes a lot less time and expertise to manage the whole thing."

The FlashStack infrastructure now handles all of the department's IT needs with the exception of the backend Oracle database. This involves all the public-facing web servers, the VDI farm, SQL servers and internal functions that include Exchange Messaging Server and a public-facing IBM Cognos® business intelligence farm for data analysis and reporting.

In addition to solving the performance-related issues the department had encountered, the FlashStack configuration has greatly reduced storage-related management tasks. "We really didn't have the skill set on our IT staff necessary to support a traditional SAN environment," Berryman noted. "It takes a lot of training, and it's very complex. With Pure Storage, it's so much easier. It has enabled us to focus our resources on high priorities like virtualization instead of having to worry about storage."

Berryman says he especially appreciates the ability to monitor storage performance though VMware Operations Manager. This allows him to monitor the health of the entire environment from a single pane of glass — including the Pure Storage flash array — "during my morning cup of coffee" using the plug-in provided by Pure Storage. "It makes it easy for me to keep an eye on storage. Knowing that it is monitored is a big relief, although I have to add that there has never been an issue with the performance or reliability of the Pure array. It's astoundingly simple. You just set it once and leave it alone. It just sits there and runs without any need for attention."

NOT ALL FLASH STORAGE IS ALIKE

Even before deciding on a FlashStack design, storage was already top of mind for Berryman. In late 2014, one of his computing providers complained of lagging performance from the department's storage infrastructure resulting in the slowdown of some key applications, notably the Cognos farm for data analysis and reporting.

In addition, the spinning-disk storage system was nearing the end of life of its maintenance contract, "so it was a good time to consider alternatives for meeting our storage needs," Berryman said.

Berryman's goal was to retire the hard-disk storage system he had been using to support the department's web servers, "and my preference was to go with all-flash." So, he purchased a flash system from the provider of his legacy storage system. The results were disappointing. "The system didn't give me the data-reduction factor that I was expecting or promised," he noted. His goal was to get a data store of some 100TB on the legacy hard-disk system compressed down to about 30TB, "to give us plenty of room to grow in the future." But the flash system he purchased, which the vendor promised would achieve a reduction of 6:1 to 7:1 only delivered 2.7:1.

So, Berryman looked for another provider of all-flash storage, and contacted Pure Storage. Once he knew that budget was available in the upcoming new fiscal year, he took advantage of the Pure Storage "Love Your Storage" program. This allows a prospective customer to use a Pure all-flash array for 30 days with no obligation and the ability to return it, no questions asked, if unhappy for any reason.

"It's astoundingly effortless. You just set it once and leave it alone. It just sits there and runs without any need for attention."

Steve Berryman, ***infrastructure manager***

"I called the Pure Storage rep, and in less than a week they had a unit drop-shipped here, racked and stacked, and production data was moved onto the flash array," Berryman recalled. "It was a real luxury to be able to do a proof-of-concept (POC) for that amount of time prior to committing to a purchase. I wish I had done a POC before buying the original flash array."

Berryman's first inkling of what it's like to deal with Pure Storage came very early on in the evaluation process. "We had just started migrating data onto the evaluation unit, and I decided to push the device beyond normal thresholds. I got a call from Pure support in less than 10 minutes, telling me they had seen some anomalies and offered ideas on how to help. In contrast, the vendor of the other flash system, which also was involved in the data migration, took six hours to call us. Pure was definitely more proactive in getting to me before something blew up."

During the evaluation period, Berryman noted several positive results from the Pure Storage array.

Based on the positive results of the POC, the decision in favor of a Pure FlashArray//m20 was easy. "Pure Storage came in with a lower price, they had 10TB more capacity, their data-reduction rate was much higher, and they had an awesome lifecycle-management story," Berryman said.

That lifecycle management story is the Evergreen Storage program, in which customers are guaranteed non-disruptive upgrades to the latest technology so long as an array is under a maintenance contract. "With Evergreen Storage, you get new controllers every three years, and there's no disruption or forklift change of equipment. With traditional storage providers, you always wind up with a 'dead brick' after three or four years, which you can't resell or recoup money from.

"Having that lifecycle map for the Pure Storage array was an easy sell for the executives," he added. "It's a better use of money."

Berryman also received the data reduction that he had wanted all along. "I was skeptical about the data-reduction numbers Pure Storage promised, because I had been oversold the first time we bought flash. So it was a real delight to see the Pure array come in and finish the job the other flash array started." The Pure array has delivered a data-reduction rate of 4:1, moving CDE toward its goal of recapturing room from the data center and turning it into usable office space.

Berryman also pointed to another advantage the Pure Storage array offers to managers of virtualized environments. "With thin provisioning, there's always concern with what's called 'zero-space clean-up'. That's a situation where you only use a portion of a storage block to provision your virtual machines, and you want access to the remaining space. What happened with our first flash device was that it didn't recognize the unused storage space, so we weren't able to capitalize on the savings from thin provisioning. You had to go into VMware and send a set of commands in order to reclaim that empty space. With Pure, that isn't a problem. It recognizes the unused space very gracefully."

info@purestorage.com
www.purestorage.com/customers