Blackboard ASP Speeds Development Work, Shortens Time to Market by 75% with NetApp

CUSTOMER PROFILE
Blackboard (www.blackboard.com) is a leading provider of e-education enterprise software applications and services. Millions of people all over the world—teachers and students at colleges, universities, and K–12 schools as well as corporations, government institutions, and educational publishers—log in to Blackboard's Blackboard Learning System™ software every day. When they do, they expect the most up-to-date content from the company's suite of e-education software.

Twice a year, this leading provider of learning tools and course management systems releases upgrades of its online learning applications. To enable customers to test their customizations of Blackboard's applications, Blackboard ASP has a shared test and development infrastructure based on NetApp's storage systems and another dedicated environment. Blackboard's test and development engineers use these environments to update application code, update the NetApp storage environment, test configurations, and issue security patches and fixes.

The dedicated environment for Blackboard's largest customer consists of a 2.5TB database on a Fibre Channel storage area network (FC SAN) and includes two pairs of clustered NetApp FAS3050 systems with a total of 36TB of raw storage—one for preproduction, the other for production—running an Oracle9i™ database.

A pair of clustered FAS960 appliances is used for NFS file access for course documents and application binaries. The solution is deployed on Dell servers running Red Hat Linux® and Sun™ Microsystems Sun Fire™ servers running Solaris™.

STREAMLINING DEVELOPMENT DURING UPGRADES
Blackboard ASP had historically relied on a mix of storage solutions in its test and development environments but experienced performance problems. “Data replication took far too long, and restores were extremely difficult to administer when the clients had missing data that needed to be retrieved from an earlier volume,” says Josh Parker, Blackboard storage architect. Blackboard ASP needed to avoid taking clients offline when its databases had to be replicated or restored. “Our largest client has a 2.5TB database that is accessed by hundreds of thousands of individual students around the world 24x7x365,” continues Parker. “We can’t impact their production environment to do a cold backup or a restore of their database.”
“I’m a big NetApp fan and love the ease of administration in using the technology. Moving completely to NetApp was huge from my perspective.”

Josh Parker
Storage Architect, Blackboard

To eliminate the need to go offline, Blackboard ASP had to double its disk storage space. Replication took 30 hours, delaying the start of the upgrade and causing productivity delays. This approach also increased Blackboard ASP’s tape and disk storage costs.

**CUTTING DATA REPLICATION TIME AND SPEEDING DEVELOPMENT**

New features in NetApp’s solutions, particularly NetApp FlexClone® software and Data ONTAP® 7G, breathed life into the Blackboard ASP storage architecture. “FlexClone was a large part of our decision to go with NetApp’s solution, but all the other great features offered by the NetApp platform made it that much easier to move away entirely from our previous storage provider,” says Parker.

NetApp SnapMirror® software replicates production databases to the preproduction environment to provide realistic test data. SnapMirror sends changes in production data as block-level changes to the preproduction database, thereby speeding updates of asynchronously mirrored data volumes. Developers use NetApp FlexClone to make working copies of the preproduction data. These cloned copies take up almost no additional storage space. NetApp Snapshot™ technology allows developers to make point-in-time copies of the data and recover them as needed using SnapRestore®.

“The ease of setting up a test and development system, especially with the FlexClone technology, is almost immeasurable compared to what we were doing previously,” explains Parker. “It used to take 36 hours to make a working copy of our largest client’s database. With FlexClone, it takes less than an hour, a more than 97% reduction.”

**IMPROVING DEVELOPER PRODUCTIVITY AND TIME TO MARKET**

FlexClone frees up developers’ time, improving their productivity. Previously when developers had a problem, they had to wait for a full restore—up to two business days. “The lost development time impacted our product development schedules,” says Parker. “Using Data ONTAP 7G and FlexClone technology, we can clone a 2.5TB database quickly, allowing our developers to start working in an hour instead of two days. Developers can move to different versioning of their projects, move seamlessly between the versions, and destroy and recreate new versions as necessary.”

As a result, Blackboard ASP’s application development time—which translates directly into time to market—has been cut from as long as eight months down to as little as two months, up to 75%. “With FlexClone, we can meet our aggressive release schedules with ease,” says Parker.

Blackboard ASP’s developers now have full control of the copies they make for their work and don’t have to ask the IT staff to replicate data volumes. “Once we showed them how easily we can do replication and restores on the NetApp storage appliances, they were very excited,” says Parker. “They were impressed with the flexibility of the NetApp environment.”

**IMPROVING STORAGE UTILIZATION AND SPEEDING DATA RESTORATION**

Before NetApp, Blackboard ASP allocated data volumes as fixed amounts of storage on a particular disk. IT staff would increase the allocations when more storage was...
needed by a particular user or application, a method that consumed significant administration time and resulted in wasted storage. Explains Parker, “We would have volumes with hundreds of gigs of free space on the same storage appliance with volumes that had just 10 or 15 gigs free. There was no way to reclaim that space without actually moving the data, which took too long to be practical.”

Using NetApp FlexVol® to virtualize storage resources now allows storage administrators to more easily provision storage and achieve better utilization. “FlexVol makes my job so much easier,” exclaims Parker. “When a volume needs more space, I can easily add it. It’s even possible to shrink a volume to make that space available.”

FlexVol and SnapRestore have already proved their worth. One customer with a large file footprint of 200GB and 15 million files noticed that some of its data was gone. Using FlexVol, Blackboard ASP was able to quickly allocate a 250GB volume to the client, then use SnapRestore to restore the client’s data. “Rather than making a copy of the data from a Snapshot copy of a traditional volume, which would have taken us up to 30 hours to restore, we were able to get our client’s data back in just two minutes.”

To recover data in the event of a disaster, operator error, or application failure, Blackboard ASP relies on NetApp SnapMirror to continually mirror data to a network appliance and between geographic locations. Backups of client databases are kept on separate NetApp storage appliances.

**Dramatically reducing storage and backup costs**

NetApp’s solutions have reduced Blackboard ASP’s storage requirements and costs substantially. Blackboard ASP has actually cut its storage needs by one-third, saving 4TB of raw storage, because it needs only two preproduction database copies, one of which can be used as both writable space and a backup.

FlexVol allows Blackboard ASP to purchase far less storage by making better use of the storage it has already purchased.

The company has eliminated tape backups for its largest customer, freeing up significant resources in physical tape, backup time, and IT administration. SnapMirror, FlexClone, and SnapRestore work together to keep data up to date on both the production and preproduction sides. “Being able to replicate this data and fall back on previous versions if there’s a problem has been huge for us,” claims Parker.

**Services and support lay a foundation for success**

NetApp’s ConsultingEdge provided professional services, installing Blackboard ASP’s first NetApp SAN and helping develop scripts for Oracle® hot backups and Snapshot copies to provide consistent backup.

NetApp’s SupportEdge Premium offers Blackboard ASP a four-hour response time that is “amazing,” according to Parker. “If I’m at the data center and need a replacement part, I can have it on hand usually within two hours, any time of the day or night.”

**NetApp passes the test, helps customer breathe easier**

Parker sums up the benefits: “I’m a big NetApp fan and love the ease of administration in using the technology. The differences in working with NetApp storage are very important for me as the storage architect and the primary storage administrator. Removing the other storage systems from our environment was a great relief, and moving completely to NetApp was huge from my perspective.”

**Solution components**

**NetApp Products**
- NetApp FAS980 storage systems
- NetApp FAS960 storage systems
- NetApp FAS3050 storage systems
- NetApp Data ONTAP 7G
- NetApp FlexClone
- NetApp FlexVol
- NetApp SnapMirror
- NetApp SnapRestore

**NetApp Services**
- NetApp ConsultingEdge
- NetApp SupportEdge

**Environment**
- Applications: Blackboard e-education software
- Databases: Oracle®
- Server platform: Dell PowerEdge blade servers running Red Hat Linux operating system; Sun Microsystems Sun Fire servers running Solaris operating system
- Employees: 800 worldwide
NetApp creates innovative storage and data management solutions that accelerate business breakthroughs and deliver outstanding cost efficiency. Discover our passion for helping companies around the world go further, faster at www.netapp.com.