

# Increases Throughput And Expands Storage Capacity



## Challenges

- Modernize storage to achieve better throughput, more space and improved backup, without exceeding budget limits

## Solution

- Deployed two Tegile HA2300 systems for primary storage
- Deployed one Tegile HA2100 for backup

## Results

- Gains between 100 and 120 terabytes of useable disk space
- Achieves 25 to 40x throughput improvement on critical systems, including Microsoft Exchange
- Users downloading Exchange email attachments were impressed enough with performance uptick to question IT about the change
- By moving from NFS-mounted drives to virtual mounted drives and leveraging high-performance storage for its Microsoft Exchange environment, the university also can load balance across blades with no problems
- Implements snapshots to aid in speeding up data recovery

Brigham Young University Hawaii graduated its first class of ten students in June of 1956, when it was known as the Church College of Hawaii. Nearly 60 years later, the private and highly selective institution hosts close to 3,000 undergraduate students, counts 400 faculty and staff members, and ranks among the top 20 western regional colleges in U.S. News & World Report's 2014 college rankings.

Through the years, the university's data center also has transformed: Today it is a highly virtualized environment, with 99 percent of its servers on virtual machines. Last year, the school was coming up against its five-year storage replacement cycle. R. Neal Moss, the university's systems and network analyst, IT Infrastructure, was determined to invest in a storage solution designed from the ground-up around next-generation technology in order to keep up with increasing demands on its VMware ecosystem.

In the next three to five years, Brigham Young University Hawaii expects to expand to over 5,000 students, without growing the number of physical servers or storage hardware capacity – even as workloads rise across all mission-critical applications, from Microsoft Exchange to Oracle to academic and student administration systems.



"My goals were to increase throughput on storage systems, increase available storage space, and move to modern technologies for storage and backups," says Moss. Simply doing a one-to-one replacement of its 63-terabyte IBM legacy storage environment, Moss knew, wasn't going to achieve those ends. He saw the opportunity to put replacement funds towards storage technology that takes an innovative approach to implementing de-duplication and compression capabilities, to achieve high capacity without exceeding budgetary limits.

"Newer storage does de-duplication, it does compression, it works out of cache instead of writing everything to spindles, and I wanted to capitalize on that," says Moss.

Equally important, Moss needed a solution that supports both Fibre Channel and NFS storage protocols. While Moss says he has long been a Fibre Channel proponent, having the ability to split the storage environment between the two protocols means he can leverage each one for its particular advantages. As an example, "when I do something in Fibre Channel, all blades get it instantly," he says. "It's auto-populated so I can move any to any cluster at any time to alleviate loads or pick up from another blade that goes down."

### Ring In The New

Moss didn't immediately rule out old-line storage companies as he began researching his options. He considered in-place vendor IBM, for instance, but concluded the company hadn't really taken storage to the next level. Its PureFlex systems, he says, were more of a repackaging of existing IBM storage solutions into a cabinet to meet users' requests for useable storage. "Then they build systems with how many spindles they think you'll need and throw more drives at it until getting the performance you want," Moss says.

That works, but it also leads to laying out a lot of cash to get the useable capacity you're aiming for – as much as five to seven times what newer, more innovative solutions charge for the same performance, he says. That doesn't cut it in the education arena, where "money is really tight and you must optimize and economize where you can, while keeping in mind that no one wants to give up performance."

Other storage contenders included Toshiba, NetApp, Exagrid, Dell and Tintri. Of the other vendors Moss reviewed, only Tintri actually was built as a ground-up next-generation storage solution, he says, but it didn't scale high enough for the university's needs. "Everyone else claimed to be [next-generation], but their concepts of what that meant could be to just fill up an array with nothing but flash drives," he says. "But pure flash is not really next-generation, because you are still doing legacy reads and writes, just with higher-speed drives."

Moss hadn't been thinking of Tegile when he began his evaluation process – and indeed was a little hesitant when an opportunity came his way to meet with company reps in Hawaii. "I'm a little leery of new companies sometimes," he jokes. But those feelings changed during the three hours he spent with the Tegile team learning about the capabilities of its hybrid storage solution that leverages both solid state drive and hard disk technology; provides file and block services; and features the proprietary IntelliFlash architecture. IntelliFlash separates metadata from the primary data path and optimizes functions such as de-duplication, compression, RAID and snapshot pointers, allowing for up to 75 percent capacity savings, while accelerating I/O by up to

seven times when compared to traditional storage systems.

"From that point on [Tegile] was the one I went with," he says. "It did everything I wanted at a price that was very affordable and in a very reliable way."

### Tegile Goes To Work on Critical Enterprise Apps, Including Microsoft Exchange

The university purchased two Tegile HA2300 systems for primary storage, replacing its IBM storage terabyte for terabyte. But remember, Moss' goal was to increase storage at budget levels, and with Tegile and its de-dupe and compression capabilities, the university actually realizes between 100 and 120 terabytes of useable disk space. "I doubled my disk space without doubling my cost," Moss says. That's a big help given the constant demands by development staff and others for more disk space for new apps and services.

The storage went into the university's production environment in the winter of 2014, starting with critical systems such as Microsoft Exchange, Active Directory, and Oracle database and ERP servers, and key web, academic and student systems. End user response to the update was unprecedented. While end users typically don't experience enough of a performance increase with a storage upgrade to even get their attention, Moss says that calls started coming in right away to ask his team what it was doing differently to increase the performance of email activities, such as downloading attachments.

That was particularly impressive given Moss' initial concerns about a potential performance hit on Exchange – and therefore to the university's 1,200 faculty, staff and admin Exchange users – by moving from NFS mounted drives to virtual mounted drives. "But we had the opposite effect," he says. Plus, he was able to increase users' mailbox sizes, too. All the applications – not just Exchange – benefitted from the change, with tests using 10 GB files indicating a 25 to 40x throughput improvement.

Also included in the university's purchase was a Tegile HA2100 for backup to take the place of its tape backup system. In

addition to backups, the university now is leveraging that system for four days' worth of storage snapshots, as well. Moss never expected to do that, but given the storage surplus Tegile enables, it only makes sense to be prepared to speed up the process of recovering data. (Only the university's test-and-development environment remains on legacy storage.)

Moss has only had to call in Tegile customer support once, when something happened to lock up the HA2100. The response was quick, effective, and caring, he says. Support personnel kept the case open for a couple of days and called back to check that the fix really had worked before closing it out.

Taking all its critical systems to Tegile as a first move, Moss says, shows the trust Brigham Young University Hawaii has put in the vendor.

---

*"Performance went up, storage went up, the number of users hitting files went up, and we increased greatly the number of files and servers on it... Everything has been so positive."*

– R. Neal Moss

So much so that Moss plans next year to expand the school's Tegile infrastructure, including purchasing systems for remote site replication. He's also looking at creating department, user and faculty shares, to give university staffers disk space to use for assignments or to exchange documents with each other. "Because of the additional storage, with the compression and the de-duplication," says Moss, "we get to see space increases to the point we can do things we couldn't do before because of space limits and funding."