

CASE STUDY:

Florida Blood Services “Snaps” Back from Overburdened Data Storage

Stringent backup and retention requirements once placed a serious burden on storage performance, prompting a move from three storage platforms to one. Today, innovative multilayered backups and integrated snapshots accelerate performance while slashing backup times from hours to seconds.

When you think everything is good in your core business, it's probably a smart idea to take a second look. That's the assessment of Calvin Levy of Florida Blood Services (FBS), a nonprofit provider of blood for critical care. He and Dan Higley, two senior systems engineers for the organization, did just that after surveying their storage architecture, with an eye towards heading off storage failures.

For FBS – which takes over 1,000 blood samples daily and subjects every sample to over 12 hours of screening and confirmatory testing – storage, backup and long-term retention are critical needs. “Our systems worked, and we thought everything was good,” said Higley. “And yet the storage snapshots used to bridge the gap between full server replications had taken a toll on storage performance. Our SAN could not handle snaps without affecting performance negatively. We had to learn to live without snaps altogether.”

In surveying the service's three-vendor architecture, based around a SAN, backup server and virtualization management software, Higley and Levy realized they could not only solve their performance issues but also reduce storage cost and complexity by adopting the Nimble CS240 converged storage array.

Today, with two Nimble arrays at the company's St. Petersburg headquarters hosting primary storage, housing 160 virtual machines and providing a direct connection to 40 remote offices, performance is high and snapshot issues are a thing of the past. Two additional Nimble arrays, targeted for disaster recovery (DR), are situated in FBS's nearby Lakeland office.

Storage Profile: Florida Blood Services

Challenges

- Complex, three-vendor storage environment
- Weekend-long backups
- Snapshot-related performance issues

Solution

- Deploy four Nimble CS240 converged storage arrays

Immediate Benefits

- Maintenance of high system performance during snapshots
- Reduction of complexity and costs by “three-vendor-to-one” decision
- Reduction of server backups from hours to seconds

Long-Term Objectives

- Move to across-the-board 15-minute snapshots
- Continue virtualization initiatives

Snapping Back to Productivity

Higley and Levy had scheduled timed replications at their DR site for lower work-usage periods. “We’re a 24x7 operation, and there’s never really down time,” said Levy. “Depending on when we took a snapshot, it might or might not have had a perceptible effect on storage performance, but once the snapshot was on the system we would start to see performance degradation.”

But things got worse following a required firmware update on their SAN system. “We could no longer take snapshots. Regardless of whether we tried to take 20 snapshots or 200, our performance was significantly hampered. Our fall-back position, and not a great alternative, was to rely exclusively on full backups.”

“Today, with Nimble in place, we use its integral snapshots. We’ve seen no performance hit whatsoever, and we’ve been able to schedule snapshots in our production environment at various frequencies. For the non-regulated side of our business, we’re taking a snapshot every 15 minutes on some volumes; on other volumes we take snapshots once an hour, and on legacy retired volumes once a day. Then we take all the volumes and replicate them to the DR site every hour.”

“And then there are automatic purge settings in the schedules that we set. For example, I may keep around my dailies for a week. I also keep weekly backups and monthly backups, and in some cases, annual backups.”

Higley adds that, by taking snapshots so frequently, they not only improve Recovery Time Objective (RTO) performance but also gain a lot of flexibility in how quickly they can restore data in the event of a loss and return to full productivity. Now, instead of relying on backups that are days or weeks old, he and Levy are creating an environment for rapid recovery in the event of any loss. “We’ve been so happy with the Nimble snapshotting system that we have increased our snapshot frequency, in some cases, to hourly – and in other cases, to every 15 minutes. In the testing of blood and cataloging of donors and their usage, it’s difficult to recreate those events, and so I’m pushing for a system-wide 15-minute backup frequency. That is paramount, and we’ve made real progress toward that goal.”

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And, once again emphasizing performance, he adds: “Today, across all of our volumes, we have thousands and thousands of snapshots on the system, and we’ve seen no degradation in performance.”

Storage ROI

Higley and Levy say the move from three-vendor storage to the adoption of Nimble, while providing immediate performance gains, also allowed FBS to regain control of its storage environment. “We’ve been able to take primary storage, backup storage and VM backups – once requiring three vendors and three services – and realize superior results by moving to Nimble arrays that support

primary, backup and DR; support over 160 virtual machines; and provide an excellent experience to our 40 offices,” said Levy. “I guess you could say it’s a 3-to-1 consolidation ratio that has worked magnificently for us. We like the ROI.”

“The migration to Nimble looked daunting at first, because we were catapulted more quickly than expected to rely on the Nimble array,” added Higley. “But, whereas performance degradation was a major challenge with our previous system, Nimble changed all of that. For example, out of approximately 150 virtual machines in our non-regulated environment, I could previously back up only 13 VMs per night without affecting performance for the majority of our users.”

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“Historically, most of our servers have been backed up weekly, and so I was starting the backups on Friday at 7:00 PM and they would go until Sunday morning around 3:00 AM – and, before a much-needed upgrade, they would extend to Sunday at 3:00 PM. With that upgrade we saved 12 hours, and I thought we were doing excellently. But now, with Nimble, we’re able to back up all of our volumes in a matter of seconds and make intermediate, scheduled snapshots that take no toll on performance, at least that we have observed.”

Making Room For a Merger

Levy adds that his storage environment today is 100 percent virtualized, and that even though a two-year-old merger with another blood bank created the need for an additional backup layer, it created no additional storage complexity.

“In addition to our active data, we have backed up what I’ll call static legacy data from years back, as well as additional data on blood donor information and blood tests that we acquired in the merger and are required to store for ‘look-back.’ Those servers have to be maintained for X number of years. But now we can virtualize those servers, since they were in a legacy mode. With the Nimble array, I can choose to take longer-term backups. So even though the data does not, or should not, change, if there were ever any level of corruption, we would be able to meet regulatory requirements by having multiple copies of backups that we could produce. In short, Nimble is a real safety net for our regulated operations.”

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And what about storage capacity? In a data-intensive environment where little if any historical data can be purged, having reserve capacity is a critical need. With that in mind, Levy reports that FBS is achieving 39.5 percent primary compression on its production arrays at headquarters, and 34.1 percent compression on its offsite DR arrays. “With inline compression alone, we’ve freed up 7.48TB of space. Imagine what we can do with that.”

Tech Support Aids in Remaining 100 Percent Operational

Levy also notes that technical support from Nimble has added a layer of comfort as FBS continues to virtualize, maximize performance and drive down costs. “I liken our support by Nimble to having a virtual field engineer on site. On a road trip down Interstate 75, I happened to check email and found that Nimble had already noted an alert from the storage array at our DR site and had taken quick action. By that evening I had a new controller coming to me by an overnight service.”

He added that the redundancy built into the Nimble array made it possible to test and replace the controller without having to power down the array. “Staying 100 percent operational is critically important in our environment.

“Nimble’s support was there, like that of a guardian angel. Of course, I always have to have my eye on support in a dynamic, regulated organization, but that’s a lot easier knowing that we have someone watching our back.”

“Next Evolution” in Technology

Higley speaks to the dynamics of the storage industry: “What impressed us most with the Nimble array was its differentiation from the other SAN arrays. It seemed to us like the next evolution in technology. A lot of other SAN vendors have been adding flash and other features to make their storage seem new and different, but we were impressed with Nimble because they’ve developed a new architecture and a new sequential file system. They’ve taken flash into account and created a cost-effective device that stages data properly, both in flash and disk-based storage, to provide the highest performance at the lowest cost.”

He adds that, after making the move to Nimble, he and Levy listened to a presentation of the new, latest and greatest features available from their previous SAN provider. “They create a picture of the wonderful life we could enjoy. But, for all of their features, and on considering our needs as a dynamic organization, we still say that Nimble, hands down, does it best.”



For all the wonders of modern science, no one has ever found a substitute for blood. So they take their responsibility seriously at Florida Blood Services (FBS). In the Tampa Bay area, 38 hospitals and 80 ambulatory care centers count on them for whole blood, blood products, and services. FBS, a nonprofit organization, is also a vital testing resource for 30 East Coast blood centers and medical facilities from Maine to Puerto Rico. In addition, they honor their commitment to transfusion medicine leadership by contributing to advances in education, research and training.

