PROTECTING EDUCATION DATA THROUGH CONTINUOUS GROWTH AND UNPRECEDENTED TIMES

Carnegie Mellon University's Campus Cloud was ready for the big spike in business that IT saw this year. Auto-discovery of unprotected servers and scalability of the institution's data protection solution have made it a true win.

WHEN CARNEGIE MELLON UNIVERSITY shifted to online learning in spring 2020 in response to the campus closure, suddenly, lots of new virtual machines (VMs) started popping up on the network. All of those VMs — and their data — needed data protection. That spike included numerous VMs to support online instruction, virtual replacements for physical servers faculty could no longer access on campus, and a handful of VMs dedicated to a research project the university was running through social media to gather data about U.S. residents experiencing COVID-19 symptoms to help forecast the spread of the pandemic.

Fortunately, the campus' Computing Services organization was ready for the big jump in business. A couple of years earlier, the university had launched Campus Cloud, which provides institutional customers access to virtual servers and associated disk space on the secure CMU network. Along with competitive pricing, flexibility in scaling and a choice of self-service or IT-supplied management, the offering also came with protection: backups in two co-located data centers, one on-site and one off-site, controlled and maintained by dedicated IT staff.

Not so long ago, central IT was covering only approximately 40 percent of what needed to be backed up, simply because it didn't have administrative oversight or visibility into all the systems in their network. "There was a huge gap on that, and a risk for a lot of these departments," noted Jayme Hoburn, a senior systems engineer and one half of the two-person team handling centralized backup and recovery services at the university.

Now, as more units on campus are shifting their operations to Campus Cloud, backup is becoming standard operating procedure. And more people have come to realize that an unexpected disaster can happen to anybody — or everybody. "I tell them it's like we're the insurance company," Hoburn explained. "You still pay your insurance policy even if your house never burns down, because your house *could* burn down."

Commvault HyperScale Technology Help

At the heart of Hoburn's work is Commvault backup technology. The basic configuration includes nightly backups, on- and off-site data

retention, restoration of individual files or entire systems, and custom configurations where they're needed.

In the last year, IT committed funding to new hardware for backup and storage while at the same time evaluating options for the software to manage that gear. The choice: a

Commvault HyperScale™ Software Validated Reference Design running on Dell servers. Commvault HyperScale is an intuitive and easy to deploy scale-out solution that is fully integrated with Commvault's Intelligent Data Management platform. It leverages commodity servers with local storage for reduced cost, easy scalability, and predictable performance. Commvault software also supports multitenancy, enabling service catalog pricing for tenants.

When the springtime surge struck IT infrastructure, the backup team had no concerns. They could easily scale out to protect whatever surfaced on the network.

"Commvault was really key for us in this," Hoburn said. Among the benefits she cited:

Familiarity. The team had been working with Commvault for five or six years, which means they "were already ingrained in how to use it."

Automation. "With another product, I'd have to have a bunch of add-ons. I could automate them,

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—Jayme Hoburn, Senior Systems Engineer

but I'd have to know five different products. We can do so much within Commvault and it's all automated. We don't have to learn other products, which is advantageous."

Simplicity. Prior to the adoption of Commvault, backups were being written to tape. "We had 12 tape libraries with 45 tapes apiece. You wouldn't believe it." Now, backups are written to disk (Commvault HyperScale), which simplifies backup and recovery.

Deduplication. Storage of the two petabytes-plus managed by the backup team shrank to about 513 terabytes. "We didn't see any other products where the numbers were as good as what we're getting in

the Commvault software. That allowed us to reduce the overall storage requirements and made Commvault cost-effective for us."

Multi-tenancy. This enables CMU to provide backup-as-a-service with a shared infrastructure, reducing cost, complexity and risk. Native self-service allows tenant admins to view and manage their own backup and recovery operations "versus having to create a ticket and wait in line and contact central IT every time they need something done. The main thing is, they don't have to call us unless they can't get it to work." Tenants can only see and manage their own data and can only perform tasks based on their assigned admin role.

Discoverability. Commvault automatically discovers new machines – virtual or physical – that need to be backed up and notifies the backup team, thereby reducing the amount of unprotected data and protecting against ransomware and other threats.

Centralized Management. The Commvault Command Center is a management platform to view all backup and recovery operations, check the health of the data and do the work. On top of that, Commvault software enables the backup team to recover files or an entire VM with a few clicks. "We're a team of two providing data protection for over 2 petabytes of data. In my experience, we couldn't do that with a lot of other products."

Reliability. There's no question that backups will meet the 12-hour backup window set by the backup team, and that's with a high success rate: In September, for instance,

What Your Users May Not Know...

1 If end users are collecting data, then it must be important. Remind them: all data must be protected.

2 If data is being backed up, make sure it can also be restored. Do they schedule regular restore tests?

3 To align backup practices with business requirements, users need to understand their data. Have they thought about how long it needs to be preserved and set its priority level for restoration in the event of a disaster?

4 A standard daily backup won't suffice for all types of data collection. If backup takes place at night and service is disrupted mid-day, could they recreate the day's data entered up to that checkpoint?

5 Backup has a price tag, and it can be especially high when legacy technology is involved. Have they considered the lower cost of ownership delivered by cloud storage? What about the use of modern data management capabilities to move data between different tiers of cloud storage?

"we had three failures out of 14,292 jobs." In every case these servers were offline. With Commvault "I don't worry about it at all, like I did on other products. My weekends are free again, and I love it."

Affordability. "We did a lot of evaluations of other storage solutions, and we found the most cost-effective solution was the Commvault HyperScale Software validated reference design."

Chasing Clouds

The advantages don't end there, Hoburn emphasized. Start with the robust reporting available in Commvault: The team can confer with business or application owners based on what the software is reporting about the size, growth or duration of their individual storage consumption. When people come to Hoburn and ask about the cost or timing or some other aspect of moving their backups to the cloud, she can run a quick report to give them the information they want. Upper management "is pretty impressed with what I can generate," she said. "Using the dashboard and reporting makes my life so much easier."

Then there's integration. As one example, the backup team receives alerts when something unexpected pops up in Campus Cloud as reported by Commvault to ServiceNow, the university's digital workflow software. Integrations are something Hoburn would like to do more of in the near future. She expects the Commvault built-in workflow engine and ServiceNow integration to help further automate backup operations and "get away from the e-mail model we're using now."

And there's no getting away from the ever-changing nature of the university technology environment.

Currently, CMU uses public cloud storage from Microsoft Azure, Amazon AWS, and Google Cloud Platform for specific storage needs. Commvault natively integrates with all three cloud solutions and offers data portability for changing business needs. Because Commvault can migrate and convert on-premises VMs to the cloud and between clouds, CMU can easily move workloads to the most appropriate computing environment at any given time, then move it again when requirements or circumstances change. Managing data and workloads among cloud providers and on-premises systems is simple.

Plus, the growing shift away from physical gear to cloud backup has aligned nicely with a move away from handling hardware on campus, said Hoburn. "During the pandemic, it was hard to get our hardware team to go in and replace parts. They had concerns." Moving forward, she explained, the hope is "to expand upon a cloud presence for disaster recovery and eventually just to eliminate on-site costs of equipment."

Campus Safety Net

So far, CMU's Campus Cloud has drawn an influential set of large and small customers, including the University Libraries; Tepper School of Business; the School of Art; Video Production

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Services; and Facilities Management Services (which placed its access control data operations under the care of IT).

Hoburn wants to see more business coming into the fold because therein is the safety net that provides the campus needs. "Being able to leverage the cloud is a big plus, in my opinion," she asserted. "The ease of setting up and supporting whatever they have has been a benefit of Commvault. We really have been able to accept and back up VMs dynamically that people don't know they need backed up yet. We can centralize that, bring it into Commvault and give them back their admin's time. We're able to respond to whatever the university throws at us from a data protection perspective. And that always makes IT look good."