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Five Keys to Keeping Your District's Digital Services Up and Running



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Technology News & Innovation in K12 Education

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Five Keys to Keeping Your District's Digital Services Up and Running

Nowadays, school districts rely on digital services for everything from teaching to administration. When things go wrong and they lose availability to their data, schools must be able to restore lost data and get their services back up fast—at a price they can afford. Here's how to do it.

Let's face it, digital data have become the lifeblood of the modern school system. Lesson plans, grades, student and staff records, correspondence, bus schedules—all now reside in the ether. Lose availability to that data and IT is going to hear about it, loudly. Not surprisingly, an increasing number of school districts are focusing on ways to ensure that this digital lifeline does not threaten business continuity—business speak for the daily, ongoing work of an institution. At the same time, they're discovering that business continuity and disaster recovery (DR) are two sides of the same coin and need to be planned together. Recovering a file accidently deleted by a teacher and rebuilding services in the aftermath of a tornado may seem unrelated, but both events rely on a district's ability to restore data quickly and get staff back to the business of education.

"In this day and age, data is all about availability," says Salim Ruffin, a senior systems engineer at Veeam Software, a company that offers a suite of backup and disaster-recovery solutions. "If there is an outage—whether a hardware or software failure, or a ransomware situation—you have to be able to recover your data quickly."

Teachers and staff expect no less. As more and more of their daily work has migrated to computers, their expectations for how these systems should operate have risen dramatically. "People now expect to be able to gain access to anything they need, regardless of the time of day," says Matt Blaine, advanced technician at Raytown Quality Schools in Missouri. "In the last five years, expectations have really changed."

"Expectations have ratcheted up significantly," adds Todd Barker, IT director for Lawndale Unified School District in California. "A lot more activities are done online that are required by the curriculum, like online student testing, so teachers and administrators have become very dependent on that."

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Given education's reliance today on computer systems, here are five keys to ensure that your school district can maintain its business continuity and weather a disaster—be it fire, flood, hurricane, human error, or a malware attack.

1 Practice the Rule of 3-2-1

At this point, every school system maintains backups of its data, but not all storage setups are created equal. Among DR and business continuity experts, the standard rule of thumb for data storage is the 3-2-1 backup rule. By that, they mean schools should keep three copies of their data on two different media, with one copy being stored off site—in cloud storage or at a secondary building location, for example.

Budget and physical constraints often force schools to tweak the rule to fit their circumstances, but many try to stay faithful to its intent. At Lake Zurich Community Unit School District 95, for instance, the DR site is located at one of the district schools. "It's across town from the other data center, so we don't use the regional approach that people recommend," says Melissa Gray, systems engineer at Lake Zurich in Illinois. "But co-locating at an offsite storage facility in another region would have brought costs as well as security concerns. Three or four years ago, there were still issues about security and access to the data, so we compromised by putting the DR center at one of our school sites."

Lake Zurich is now in the process of evaluating cloud-storage options instead. "There are a lot of benefits to cloud nowadays," says Gray. "Microsoft's Azure Blob storage, for example, is way cheaper than buying a SAN of our own, so we might put our archival data in there, or even possibly our replicated data."

Raytown has already discovered the benefits of cloud storage, using Veeam Cloud Connect to back up its data with OffsiteDataSync, a cloud storage provider. For years, Raytown used tape at its previous backup location, in keeping with the 3-2-1 rule that data should be stored in two different media. But tape comes with its own issues. "It was becoming very cumbersome to manage tape drives at an offsite backup," says Michele Reed, Raytown's system administrator for servers. "You have to be able to restore from tapes and they would go bad. And it took an exorbitant amount of time to find the right file if we needed to pull something off those tapes. With Veeam, restoring files tends to take less than 30 minutes."



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2 Establish RTOs and RPOs

Everyone's heard of service level agreements (SLA), contracts that specify how well a vendor's service will operate. In the world of business continuity, RTOs and RPOs are similar, except they tend to be internal performance targets, not contracts. RTO stands for recovery time objective. Put simply, how long can a service be down before faculty, students, and staff chase you with pitchforks? For many schools, the answer will depend on the service. If the library goes down for two days, it's not the end of the world. But if the student management system goes up in smoke, backup systems may need to be in place within minutes.

RPOs, or recovery point objectives, deal with another pain point: If one of your services suffers a complete meltdown and needs to be restored, you are going to lose any data generated since the last backup or replication. So how much data are you willing to kiss goodbye? Ten seconds' worth? Fifteen minutes? A day? A week? Again, the answer may vary for different services in your system, as well as on your storage budget.

At Lake Zurich, IT categorizes its services into three groups: mission critical, which includes the student management system, HR, and the busing system; business critical; and technical services. "Mission critical has to be up no matter what, so we replicate those services over to our DR site every couple of seconds," says Gray. "In the event of an emergency, those mission critical systems are up in an hour."

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All other services at Lake Zurich are backed up daily using Veeam, rather than replicated. "If we had a disaster, we would restore everything else from backup based on how each service is prioritized," says Gray. "Services like our library system could wait a day or two for restoral, while some of our technical systems could wait a week."

So why not just consider every service to be mission critical and be done with it? Quite simply, cost. Replication is not just a backup—it's set up to allow the system to fail over—and it is significantly more expensive than backup. Most school systems have a hard time justifying its use across the board. "Cost does play a significant role in that decision," says Blaine.

Raytown replicates its 10 most critical servers, including financial records, student information, network data, and transportation daily to a local host, which maintains copies (known as restore points) dating back seven days. The district also replicates these same servers in the cloud, with four restore points. As for backups, the district keeps 10 days' worth on local SAN storage, and 90 days' worth in the cloud. With this setup, the RPO and RTO for Raytown's mission-critical systems are within

24 hours in the case of an outage, and 48 hours for other systems. "If we wanted to move our objectives closer to zero, I think the additional costs would come from storage and computing resources to increase the frequency and volume of replication," says Blaine.

Lawndale USD's approach is also driven by the need to balance cost with acceptable RPO and RTO numbers. "We're not a bank," says Barker, who contrasts his district with financial institutions that might record thousands of transactions a minute. "One hundred percent up time and a guarantee that the DR site will be up in five minutes is going to cost us $10,000 a month or whatever. Is it worth the cost? No. We can all go back to paper for three or four days instead."

While an organization's goal for RTO represents the maximum amount of time that a service should be down, most recovery times are actually a lot faster. Raytown, for instance, has had to roll back an entire server on a couple of occasions, due to corruption and a problem during a Windows server update. "With Veeam, it takes about 30 minutes to restore an entire server," says Blaine. "Most of the time, though, we deal with minor requests—someone deleted a file inadvertently—and those just take a couple of minutes."

3 Use the Right Products for Your District

IT staffers tend to be highly visible, mainly because their hair is on fire. As technology has come to play a greater role in education, the responsibilities of the IT department have grown accordingly. Budget and staffing numbers have not. As a result, IT staff time is like gold and should not be frittered away on maintenance tasks that could be handled more efficiently. And backup is one of those jobs that can turn into a real time suck for staff, usually for two reasons: The backup software is not suited to a district's particular needs, and compatibility issues among vendor products.

Consider the experience of Raytown, which used another product before switching to Veeam to handle its nightly backups. "With our previous solution, I would spend the first three hours of my workday reviewing the backups and making sure they ran," says Reed. "In contrast, Veeam does a verification at the end of the backup job and then sends me an email. We never have to look at the Veeam server unless we get an email that something failed or didn't end correctly. We've saved hours a day as a result."

It's a similar story at Lake Zurich, where staff also ended up wasting a lot of time with the district's previous backup software. "The program was very limited, and we spent about 15 hours a week on our backups and fixing problems," says Gray, who ditched the program in favor of Veeam about three years ago. "Now we spend maybe an hour a week on backups, mostly checking that there are no weird fails or anything like that."

Compatibility issues between vendor products can also lead to hours wasted in trouble-shooting. When Raytown first implemented Veeam Cloud Connect, for instance, it utilized Microsoft Azure as its cloud storage provider. "We ran into some problems from the get-go," says Jon Coleman, assistant director of technology operations. "It was kind of a clunky solution and wasn't fully integrated with Veeam at the time." A lot can change in two years. Today, Microsoft Azure is fully compatible with Veeam Cloud Connect and is one of the cloud solutions currently under consideration by Lake Zurich.



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4 Make Data Recovery Easy

As important as it is to make backup quick and easy, the same is true—maybe more so—of restoring data after a failure. Unlike backup, data restoration is only an occasional event, and IT staffers can easily forget the procedures during those periods when everything is running smoothly. "A backup product could be running for six months with no one using it because no recoveries have been needed," says Ruffin. "If I don't use a product for six months and then suddenly I need it, you can imagine ease of use comes into question."

Failures occur on a continuum, ranging from the loss of a single file to a migraine-inducing meltdown, but recovery policies and structures should be standardized to ensure a quick and efficient response.

Using a product like Veeam Backup & Replication, for example, IT staffers navigate a system that would be familiar to anyone who's browsed for files in a Windows machine. At a click of a button, they can restore an entire virtual machine or drill down to restore a single document, such as a PDF.

At Raytown, Lawndale, and Lake Zurich, data-recovery requests are currently funneled to an IT administrator for action. While this approach gives IT oversight, it does increase recovery time—the administrator might be in a meeting or off site. To speed up recovery times, some institutions are now implementing self-service portals that allow teachers and staff to restore files and folders on their own. In the case of Veeam's product, for instance, users employ a simple web interface to recover files in a matter of seconds, while permissions rules ensure that users have access only to the appropriate files.

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"They can see only their own computer," says Ruffin. "They recover what they need using a Windows-style file explorer. They can't break anything, so it makes the end user feel safe and gives confidence to the administrator."

5 Take Ransomware Seriously

Viruses and malware can wreak havoc on district operations, and ransomware is the latest scourge to hit education institutions. In January 2018, the FBI warned that a hacker group known as The Dark Overlord has "conducted various extortion schemes with a recent focus on the public school system." The report goes on to say that this group alone is responsible for at least 69 intrusions, and has attempted to sell 100 million records containing personally identifiable information (PII). Further, the group has released PII on more than 7,000 students after their school districts refused to pay ransoms. And it's not the only bad actor out there.

Having student records spewed onto the Internet is no picnic. Neither is seeing school data encrypted by hackers who will release the key only upon payment of a ransom—another favorite extortion strategy. Without adequate storage and security protocols, a school district could be out of action for weeks if it has to rebuild services from scratch or old backups.

Lawndale has already experienced five small ransomware incidents. Teachers and, in one case an administrator, clicked on attachments in e-mails or visited an infected website from laptops that they had taken home. "We were able to recover the data from our backups for those people who told us about the problem," says Barker. "But we didn't know about a couple of the incidents until after they had paid ransom. This is not what we recommend."

Barker stresses the importance of having someone—either in-house or a third-party vendor—design a DR and backup plan that is going to prevent ransomware from spreading through the network. Firewalls and antivirus software are obviously part of that, but so is ensuring that your data storage involves a mix of replication and backup. Used on its own, replication can leave data vulnerable to malware or corruption, due to the limited number of recovery points that are usually available. Lake Zurich's replicas, for example, extend back only six hours. "If the malware is caught early, replication is still a viable recovery alternative," says Gray. "If it's longer, we would need to go to backups."

Second, Barker stresses the need to educate the school community about what to do—and not do—in the Wild West of the Internet. "It is important that you train your teachers and staff to avoid the pitfalls of ransomware—what to click on, where to go, and when to stop clicking," he says. "And as soon as they recognize something is going on, they need to let IT know immediately. We only keep our backups for 14 days, typically. Longer than that and recovery becomes much more difficult."

Getting Started with Veeam

Veeam Backup & Replication is a software program that provides backup, replication, and recovery services for virtual, physical, and cloud-based systems. Salim Ruffin, a senior systems engineer for Veeam Software, talks about what it takes to implement the company's solution.

"The great thing about Veeam is that it can be downloaded from our website. The whole install takes about 25 minutes from start to finish. If you're tech savvy, you can do it yourself, or one of our engineers can assist you. Customers need a simple virtual machine—it can be provisioned in minutes—with four cores and eight gigabytes of memory, standard Windows build. You'll need an account to allow you to log into the virtual infrastructure and also a backup repository to write the data to. You don't need to reconfigure the infrastructure. Just install the software, put in the accounts, and start backing up straight away."



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About Veeam

Veeam is the global leader in Intelligent Data Management for the Hyper-Available Enterprise. Veeam Hyper-Availability Platform is the most complete solution to help customers on the journey to automating data management and ensuring the Hyper-Availability of data. We have more than 294,000 customers worldwide, including 75 percent of the Fortune 500 and 58 percent of the Global 2000. Our customer satisfaction scores, at 2.5X the industry average, are the highest in the industry. Our global ecosystem includes 55,000 channel partners; Cisco, HPE, and NetApp as exclusive resellers; and nearly 19,000 cloud and service providers. Headquartered in Baar, Switzerland, Veeam has offices in more than 30 countries.

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