



CASE STUDY

Virtual Machine Data Recovery on RAID and SAN

Lost! US State School District's Centralized Storage System

Twelve virtual machines running on an enterprise class SAN with multiple redundant layers that should not have gone down—but did.

Data Loss Situation

The centralized storage system for the entire state district's school system was only four years old and huge—twelve virtual machines stored on fourteen RAID 5 systems running ESX 4 servers clustered in a SAN storage environment that distributed all the school district's data across 70 hard disk drives.

During a power surge, the enterprise system lost six of its enterprise drives in staggered failures. Normally, this failure would be sustainable in a degraded state, but there were additional complications. Two failed drives were located in the same RAID 5, corrupting the metadata, causing a cascading effect. The SAN was down. Every school in the district was down. No student data. No administrative files. No payroll records. Students couldn't access term papers—teachers could not be paid. This data loss had wiped out everything.

Data Recovery Solution

The 70 drives were shipped to DriveSavers in two large crates. Before starting recovery on the layer of virtual machines, the physical drive failures first had to be resolved in our ISO 5 cleanroom. Then all drives had to be imaged to clone drives, the corrupted data on the SAN network had to be restored and the RAID arrays rebuilt. No small feat considering that these arrays use their own special algorithms to store the data randomly across the drives.

"This was as complex a recovery as it gets at DriveSavers," said Trea Kines, senior enterprise recovery engineer at DriveSavers. "On top of everything else, the original manufacturer had embedded a proprietary encrypted file system into the virtual machines."

After significant engineering effort, the SAN was up, the cluster rebuilt and twelve individual recoveries were performed to verify the data on each of the virtual machines. Within a remarkable two-day time span, all of the school district's data had been recovered.

We Can Save It!

DriveSavers leads the field in recovering data from virtual infrastructures, servers, file systems and workstations. DriveSavers engineers have unprecedented relationships with leading enterprise storage manufacturers. Working closely with their escalation and development engineering teams allows DriveSavers to analyze, understand and resolve the complex data loss issues that can occur in virtualized data storage environments.



"Virtualization is a boon to organizations who want to increase their storage efficiency and agility. But storing all your data in one location leaves it extremely vulnerable if you are not prepared for system failure, data loss and the need for data recovery."

— Trea Kines, DriveSavers
Senior Enterprise Recovery
Engineer

DriveSavers Virtual Machine, SSD and RAID Data Recovery Services

Virtual Infrastructures

- VMware® vSphere
- VMware® vCloud
- Microsoft Hyper-V

Virtual Servers

- VMware® Server
- VMware® ESX
- Microsoft Hyper-V
- Citrix XenServer

Virtual Workstations

- VMware® Workstation (all versions)
- VMware® Fusion
- Citrix XenDesktop

High performance virtualized systems use enterprise grade storage devices built on hard disk drives (HDD) and increasingly, to maximize performance and efficiency, on solid state drives (SSD). Proprietary recovery tools and technology developed through trusted alliances with leading SSD and NAND flash-based storage device manufacturers allow DriveSavers engineers to overcome unique, one-of-a-kind data loss scenarios from solid state storage devices. Complex failures can include SSD controller issues, encryption and encoding variations, NAND flash chip failure and customized wear-leveling algorithms. As a result, DriveSavers has successfully completed more data recoveries on solid state-based devices, including mSATA, RAID and PCI-e formats, than any other data recovery service provider in the industry. No other data recovery company in the industry can make this claim.

Lost Data? We Can Save It! Call 800.440.1904

Enterprise Data Recovery Advisors are available 24/7.

Successful recoveries on all storage devices and all operating systems since 1985.



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- International: Your access code +888.440.2404
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Fast, Reliable, Certified Secure Data Recovery

- Fastest Standard Turnaround Time at 24-48 hours
- Priority 24-hour nonstop service.
- Certified ISO 5 cleanroom
- Engineers certified to recover from encrypted files and drives
- Qualified to handle enterprise-class recoveries
- Annual SSAE 16 SOC2 Type II security audits
- Compliant with the following data privacy and security regulations and guidelines:
 - NIST SP 800.34 (Rev. 1)
 - ISO 27000
 - HIPAA
 - FERPA
 - GLBA
 - SOX
 - PCI
 - PII
- Forensics and eDiscovery
- High Security Service
- Secure FTP for instant access of business-critical data



Companies Around the World Trust DriveSavers

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