Sanitation District manages data with HP Storage

Vallejo Sanitation & Flood Control District relies on HP StoreOnce Backup and HP StoreVirtual Storage to support virtualized environment

Industry
Government

Objective
Provide redundant storage and backup solutions to support a virtualized server infrastructure running business-critical applications

Approach
Create a standard for data center implementation with HP Converged Infrastructure technologies to ensure continuity and data integrity

IT matters
• Reduced daily backup times by 7+ hours
• Eliminated overtime and eased administration for managing server and storage infrastructure
• Compressed backup data by 8x using deduplication
• Ensured redundancy by enabling backup of entire server infrastructure
• Decreased restore times for virtual machines from three hours down to minutes

Business matters
• Disaster recovery solution ensures availability of critical applications for maintaining public services
• Affordable enterprise-class storage solutions enable better processes
• Smaller infrastructure reduced hardware and power consumption

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— Jason Kaduk, Information Systems Specialist, Vallejo Sanitation & Flood Control District

About Vallejo Sanitation & Flood Control District
The Vallejo Sanitation & Flood Control District (VSFCD) is an independent special district created by the State of California to collect and treat wastewater, and protect the Vallejo community from flooding. Since 1952, the District has collected and treated the wastewater generated by more than 115,000 residents of Vallejo and the surrounding area.

When the rains come

Every year the news is filled with reports of floods due to heavy rains or storm surges from hurricanes. Floods can not only threaten homes and businesses, but they very frequently threaten civic water systems by causing wastewater to mix with public water sources.

The Vallejo Sanitation & Flood Control District is an independent special district created by the State of California to collect and treat wastewater, and protect the Vallejo community from flooding. Since 1952, the District has protected public health and the San Francisco Bay by collecting and treating the wastewater generated by more than 115,000 residents of Vallejo and the surrounding area. In addition, the District helps save lives and protects property from storm water damage. Its mission is to provide quality wastewater and flood control services to the community in order to protect the public's health, safety, and the environment. Every day of the year, the District helps protect the public's health and environment with advanced treatment methods and skilled, dedicated employees.

Watershed moments for IT

When Jason Kaduk, Information Systems Specialist at Vallejo Sanitation & Flood Control District, joined the organization eight years ago, a consulting group was running five servers to support all of the District's critical applications. "We had no redundancy at all," says Kaduk. "If one server went down, it took whatever applications were installed on it down for the duration it took to fix the machine or to get a replacement." To overhaul the server environment, the IT department deployed HP ProLiant servers and implemented clustering to increase application availability.

"We can restore a virtual machine in less than 10 minutes using the StoreOnce and Veeam—and that's to restore everything, not just the data."

– Jason Kaduk, Information Systems Specialist, Vallejo Sanitation & Flood Control District

IT also started to replace the District's network. "The network setup was a mess," says Kaduk. "Some servers had multiple network cards, and people were constantly complaining about network speed." The District began implementing HP Networking Switches, which helped to improve network speed and reliability. For storage, it deployed HP P1000 and P500 Modular Smart Arrays (MSAs).

In 2009, the District decided it was time to begin virtualizing its server infrastructure using VMware. For storage to support virtualization, it started with an HP ProLiant DL380 Storage Server. However, as it added applications and data grew, the District knew it would require SAN storage. Happy with the performance and support it got from its HP MSAs, it decided to consider SAN solutions from HP.

Managing the flow

Today, the District has about 96% of its server infrastructure virtualized on VMware ESXi for running applications including Microsoft® Exchange Server, Microsoft SharePoint® Server, and its financial software. For SAN storage, it originally deployed an HP StoreVirtual Storage System.

The District maintains two data centers for redundancy, and it has configured three tiers of storage to support its virtualized and physical server infrastructures to ensure efficiency and performance. Its third tier storage is provided by the HP ProLiant Storage Server, which holds about 4 TB of data including map information for its Geographic Information System (GIS) that show where field assets such as manholes and storm water drains are located throughout the region. It also holds other videos, pictures, downloaded software, and patches. For its second tier of storage, the District uses the HP MSAs. "We use the HP MSA SCSI to store about 1.5 TB of data from our plant video surveillance," explains Kaduk. "The HP MSA with Fibre Channel systems we use to support virtual machines in our VMware environment that we only power on periodically."

To support the majority of its virtualized environment—its first tier storage—the District has deployed two HP StoreVirtual SANs at each of its data centers. All of the HP StoreVirtual SANs have four nodes and have about 6 TB of storage apiece. The District

uses Network RAID 10 to stripe and protect multiple copies of data across a cluster of storage nodes, eliminating any single point of failure. It also uses thin provisioning to avoid the need to pre-allocate storage. "With two HP StoreVirtual SANs on each side, we can lose half the network and continue to run without interrupting service," says Kaduk.

A picture says more

The District uses the reservationless snapshot feature on the HP StoreVirtual SANs to roll back an application configuration, or to provide a quick restore. "By having a virtual network and tools like snapshots, we work almost no overtime because we can get everything done during the day without affecting the workers," says Kaduk.

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Recently the District had an issue upgrading an application it uses to track sanitation processes. "It failed three times in a row, so we took snapshots every single time to determine what was wrong," says Kaduk. "We were also able to clone the machine so the software vendor could work with it. They fixed it and then we deployed the upgrade with no problems. We only have two people in IT, so the snapshot capabilities on the HP StoreVirtual SANs enable us to have basically a test and a development environment without requiring additional resources."

Backup is a good thing

To increase redundancy for its virtual infrastructure, the District also deployed two HP StoreOnce Backup systems. Originally it was using a Symantec backup solution, but to support the entire infrastructure required having an agent installed on every server, which was cost-prohibitive. "With the Symantec solution, we were backing up the data on all our machines, and then if we had a failure we'd have to restore the whole entire Windows® OS, restore all the settings, and

then we had to restore all the data," explains Kaduk. "We couldn't back up everything, which is what we wanted to do."

Now the District uses Veeam Backup & Replication 6.5 software in conjunction with the StoreOnce systems. It has one StoreOnce deployed at its main data center that receives the nightly backups and then replicates over an encrypted connection to another StoreOnce located at a remote facility.

Reduced daily backup time by 7+ hours

The District found that using the HP StoreOnce dramatically increased the backups speed. When it was using Symantec, backups would begin at 6:00 P.M. and end at around 8:00 A.M. the next morning—and it was only backing up data, nothing else. "By using Veeam in conjunction with the StoreOnce, now we start our backups at 6:00 P.M. and they end less than four hours later," says Kaduk. "The throughput is phenomenal and we're getting everything: the operating system, the settings, data—all of it. The other cool part is that we don't have to have an agent on every machine."

Compressed backup data by 8x using deduplication

With the HP StoreOnce, the District can retain more backup data in a smaller disk space because deduplication eliminates redundant data from storage by examining the data stream as it arrives at the storage appliance and checking for blocks of data that are identical. Kaduk explains, "With the deduplication on the HP StoreOnce and the Veeam software, we store about 16.8 TB of data, but on disk we're about 1.8 TB, so we get about an 8:1 deduplication ratio."

Less than 10 minutes to restore virtual machines

Another area where the District saw dramatic improvement was in restore times. With its Symantec solution, just to restore the data for a virtual machine would take two to four hours—and that time was not counting time to restore the rest, such as the operating system and settings. "We can restore a virtual machine in six minutes using the StoreOnce and Veeam—and that's to restore everything, not just the data," says Kaduk.

Enterprise-class solutions at a small-business price

With HP Converged Infrastructure technologies supporting its virtual environment, the District believes it gets the best value possible. "If we were to build the type of network we have right now using another vendor's solution—say Cisco—we could easily spend up to $600,000," says Kaduk. "As an organization that operates as a small business, we get a pretty big bang for our buck with all the HP solutions."

He continues, "Having a one-stop-shop for support is also important to us. If we used multiple vendors, we'd have people pointing fingers and it would take forever to get things fixed when problems arise. Now we can say we are HP all across the network, we know that everything is up to date, so that makes keeping things up and running much easier."

Customer at a glance

Hardware
- HP ProLiant servers
- HP ProLiant Storage Server
- HP StoreVirtual Storage
- HP StoreOnce Backup
- HP Modular Smart Arrays
- HP Networking Multi Layer Core Switches

Software
- HP PCM Plus Network Management
- Veeam Backup & Replication 6.5
- VMware

Operating system
- Microsoft® Windows® Server
- Red Hat Enterprise

Network Protocol
- 10 Gigabit Ethernet
- 1 Gigabit Ethernet

HP services
- HP 24x7x4-hour Support

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