BACKUP/RECOVERY/ARCHIVING
CLUSTERING
CONSOLIDATION
DATABASE
MANAGEMENT/UTILITIES
MESSAGING
VIRTUALIZATION

COMPANY OVERVIEW

Red Anvil is a network services provider, hosting facility, and IT solutions firm located in Milwaukee, Wisconsin. *www.redanvil.net*

CHALLENGE

Proven Direct, a client of Red Anvil and a full-service marketing company, needed to build a unique Web application for one of the world's largest retailers; Red Anvil required an infrastructure that would enable it to meet aggressive service-level commitments

SOLUTION

Dell™ PowerEdge™ servers featuring dual-core Intel® Xeon® processors with Microsoft® SQL Server 2005 power custom image-processing applications; the company used VMware® ESX Server and VirtualCenter software to pool processing resources; Dell Services helped deploy a Dell/EMC SAN array to heighten application performance

BENEFIT

The new infrastructure combines to form an extremely scalable application architecture that offers customized calendars to shoppers at the retailer—helping Red Anvil and its client, Proven Direct, meet their commitments; sourcing the full product line from Dell simplifies deployment and support of the project infrastructure

Forging Ahead

Red Anvil turns to Dell servers and storage to craft a sophisticated, ironclad network infrastructure and application environment for a leading global retailer

While a slew of companies focus on application infrastructure hosting, Internet and network services, or disaster recovery solutions, Red Anvil makes its mark by combining all these services and providing extensive competencies to help its customers fulfill their needs throughout the life cycle of IT projects. Based in Milwaukee, Wisconsin, Red Anvil offers network services, disaster recovery, data center co-location and hosting, managed services, and Web application development. And, as if it needed additional competitive distinctions, Red Anvil also offers a suite of IT solutions—ranging from managing client routers and firewalls to supporting servers, desktops, and applications.

Needless to say, Red Anvil relies on a broad and critical IT infrastructure to help address its customers' requirements. "Most companies specialize in providing network services, hosting IT infrastructure, or developing Web applications," explains Shawn Longtine, chief operations officer at Red Anvil. "We do all of that, as well as offering ISP and disaster recovery solutions. A lot of co-location providers will make all sorts of uptime promises, but they don't have the technical people on staff to perform application or operating system work. Because of our broad-based expertise, we don't hand off work to other companies. We're a full-service integrator from the WAN all the way to the desktop."

DELL

> When it comes to understanding and supporting the architecture of the project, Dell is with us every step of the way. If we need help installing the SAN or if we have questions about VMware VMotion, Dell is our single point of contact. For a complicated, multifaceted project like this, that is invaluable."
>
> — **Shawn Longtine**, Chief Operations Officer, Red Anvil

A leading global retailer selected a Red Anvil client, Proven Direct, to develop, host, and maintain a suite of novel applications that would provide an exciting new service for the retailer's customers. "The retailer wanted to offer a custom calendar creation application to shoppers," explains James Radke, director of technology at Proven Direct. "This was an extremely important project. Timing was crucial—since the calendars were likely to be holiday gifts, we needed an infrastructure that could process thousands of complex orders a day."

The applications would handle the processing of calendar orders, the conversion and creation of the custom calendars, and the transmission of completed, digitized calendars to the company's presses. Red Anvil was faced with providing the infrastructure and application environment to process and transfer thousands of orders a day, each containing files of about 750 MB. And, in order to meet service-level agreements, Red Anvil needed to demonstrate superior uptime.

To handle the processing and uptime specifications, Red Anvil turned to Dell to provide the total application infrastructure. "We use Dell across all of our projects, so we know Dell, and our customers know Dell," says Longtine. "But our reasons for choosing Dell as our hardware provider for this project go beyond familiarity. Leading-edge technology from Dell means we can get everything that the project needs—from servers to storage to switches to software. Dell really makes it easy to build out such a large application infrastructure."

Dell PowerEdge servers drive a custom calendar application

Proven Direct built and maintains a unique personalized calendar creation application for the global retailer. "The application allows your grandmother to come into a store with a shoe box full of pictures—or her daughter to arrive with the memory card from her digital camera—and choose a specific picture for each month on the calendar," explains Radke. "As far as our IT infrastructure is concerned, customer images are submitted from the retail locations or via the Internet, and the Dell PowerEdge servers at Red Anvil marry those images with the calendar template. Then the file is converted to a PDF and sent to a raster image processor that finalizes the images to be sent to the presses."

On the front end, Dell PowerEdge 1955 blade servers with dual-core Intel Xeon processors running the Microsoft Windows Server® 2003 Enterprise Edition operating system receive the customer's calendar images and transform them into PDF files that can be read by the printer. "Currently, the application architecture is processing about 8,000 to 10,000 calendars per day, and each calendar contains about 750 MB worth of custom data," claims Longtine. "In order to meet the processing requirements, we have eight PowerEdge 1955 servers spread across two chassis. The beautiful thing about this architecture is that we can add up to ten server blades per chassis to meet increased demand, which makes the infrastructure very scalable."

In the middle, two PowerEdge 2950 servers with Intel Xeon processors running the Microsoft Windows Server 2003 operating system host a Microsoft SQL Server 2005 database that supports order management and tracking. "The middle-end architecture is not extremely processor-intensive, but the servers are called on to provide enough horsepower to handle graphics-intensive processing and the PowerEdge 2950 servers meet our performance requirements," says Lontine.

On the back end, Dell PowerEdge 1955 blade servers with Intel Xeon processors running the Microsoft Windows Server 2003 Enterprise Edition operating system cache and serve the calendar framework to Proven Direct presses. "Making sure that the order has oversight, is processed, and is shipped is a business-critical component of the system," says Longtine. "In order to support the application data needs, we deployed an SQL Server database across two PowerEdge servers in an active/active configuration, and then we used database mirroring to ensure that the data is in sync across the two servers. Database mirroring enables high application availability, and the combination of SQL Server and PowerEdge servers provides the speed to handle order processing on the fly."

VMware virtualization software transforms servers into a vast processing pool

In order to ensure a scalable application architecture, Red Anvil decided to virtualize its PowerEdge 1955 blade server infrastructure using VMware ESX Server virtualization software. "The primary appeal of using blade servers with VMware ESX Server is its immense scalability," Longtine explains. "Going forward, we expect to handle up to 50,000 calendar orders per day. Not only does virtualization benefit performance in terms of teaming the server blades together, but it also makes the server infrastructure easier to manage. Put simply, there is no comparison between managing a VMware virtualization environment running on a cluster of blade servers versus a single physical server that is acting as the shared resource pool."

In fact, by enabling Red Anvil to create a shared processing pool, ESX Server helps ensure long-term viability of the application environment. "Instead of trying to get multiple operating systems on a single physical server, we are using ESX Server to essentially create a single virtual machine across all of our blade servers," Longtine elaborates. "Right now we have four server blades in each chassis. But going forward, we can scale up to ten server blades per chassis and pool those resources using ESX Server. Plus, because of the PowerEdge multi-core processor advancements in the server blades, we can get an incredible amount of parallel processing out of the virtualized server pool."

Aside from improving server utilization rates and promoting scalability, VMware VirtualCenter streamlines server management. "With VirtualCenter, we have a lot of remote management flexibility," Longtine says. "For instance, we have the ability to take snapshots of the full instances of the operating system at a particular point in time and store it on our SAN. In fact, we use VirtualCenter in conjunction with SQL Server and our storage infrastructure to help ensure maximum application availability, which is a major benefit."

Additionally, Red Anvil relies on VMware VMotion™ functionality to both optimize application performance and help prevent costly downtime. "Using VMotion, we can fine-tune resource allocations based on processing requirements, which helps improve overall performance," Longtine continues. "Plus, if we need to bring down a server blade to perform maintenance, we can shift resources within the server pool without impacting application performance. The bottom line is that with VMotion we do not have to worry about hardware failures or maintenance issues."

Dell storage optimizes application performance

To support the data access and storage needs of the application architecture, Red Anvil decided to implement a Dell/EMC CX3-20 storage area network (SAN). "The primary appeal of the Dell/EMC SAN from our perspective is application performance," Longtine explains. "Each rack-mount and blade server has two cards that facilitate a 4 Gbps connection to McDATA Spheron 4700 Fibre Channel fabric switches. This architecture helps prevent lag time when the application reads and writes to disk. Plus, we can easily scale the architecture by adding additional shelves to the array."

To expedite a successful implementation, Dell Services sent an EMC storage specialist to help Red Anvil install the Dell/EMC CX3-20 SAN. "We did not have the in-house expertise at the time to deploy the SAN," says Longtine. "Not only did Dell Services help us deploy the SAN, they also trained our staff on how to monitor and administer the SAN, which helped us become self-sufficient in supporting the storage infrastructure."

In the storage environment, data backup takes place on disks within the array. "It really is a free-flowing process," says Longtine. "For us, data backup is not as crucial as performance, but we do use Symantec Backup Exec to back up critical data at certain points in the process as a precaution against total system failures."

According to Longtine, Dell not only serves as a single source for all of the company's storage products but it also provides the support and services to help ensure the long-term success of the entire application infrastructure. "The fact that Dell can provide a total storage infrastructure is very valuable to us in terms of saving time and resources," he says. "But beyond that, whenever we have a question, we can get on the phone with our sales engineer, and they have the depth of knowledge to help us tweak and modify the storage environment for optimal performance. Without Dell Services, we would have to piece the storage environment together by ourselves. Now we receive full service support from the time we place the order through deployment and beyond."

Dell Support Services provides insurance for Red Anvil

Aside from delivering a full range of products, Dell Gold Enterprise Support provides Red Anvil with an important facet of the application's success. "Nearly every component of this project comes from Dell," says Longtine. "When it comes to understanding and supporting the architecture of the project, Dell is with us every step of the way. If we need help installing the SAN or if we have questions about VMware VMotion, Dell is our single point of contact. For a complicated, multifaceted project like this, that is invaluable."

> Not only did Dell Services help us deploy the SAN, they also trained our staff on how to monitor and administer the SAN, which helped us become self-sufficient in supporting the storage infrastructure."
>
> — **Shawn Longtine**, Chief Operations Officer, Red Anvil

Project success points to future Red Anvil product offerings

The calendar project has been a success for Red Anvil and its client, Proven Direct. "Any time you can take a project of this magnitude, build it from the ground up, and get it to work, there is a sense of success," says Longtine. Radke agrees, "The success of this project was not just measured by our collective ability to get the infrastructure up and running. It had to perform and it had to be available, because the ramifications of failure were easily quantifiable. Revenue would be lost if we could not do what this high-profile client hired us to do."

Red Anvil credits Dell not only for providing nearly all of the infrastructure for the project, but also for collaborating on the design of the overall solution that will be scalable for Red Anvil going forward. "Red Anvil primarily serves the small to medium business market, but with Dell we have shown that we can handle any size project for any size organization, including enterprises," says Longtine. "We are extremely comfortable doing any other project of this scope or larger at any time with Dell."

HOW IT WORKS

HARDWARE

- Dell™ PowerEdge™ 2950, PowerEdge 1955, and PowerEdge 1950 servers with Intel® Xeon® processors
- Dell/EMC CX3-20 SAN array
- 4 Gbps McDATA Spheron 4700 Fibre Channel fabric switches

SOFTWARE

- 64-bit and 32-bit Microsoft® Windows Server® 2003 Enterprise Edition
- 64-bit Red Hat® Enterprise Linux®
- Microsoft SQL Server 2005 software
- VMware® ESX Server with VMotion™ technology
- VMware VirtualCenter
- EMC® PowerPath® software
- Symantec Backup Exec

SERVICES

- Dell Services
- Dell Gold Enterprise Support

April 2007

Printed in the U.S.A.