



### Overview

**Country:** United States

**Industry:** Utilities

### Customer Profile

Valero Energy Corporation of San Antonio, Texas, is one of the top oil refining companies in the United States, with 20,000 employees, 4,100 service stations, and U.S.\$38 billion in annual revenue.

### Business Situation

Valero's Linux-based Web infrastructure was difficult and expensive to maintain and change. The site also had security vulnerabilities and scalability problems.

### Solution

Valero migrated its corporate Web presence to a comprehensive solution using Microsoft® Windows Server™ 2003, Content Management Server 2002, and SQL Server™ 2000.

### Benefits

- Fast, easy content authoring
- 25 percent less IT maintenance
- Tighter Web security
- Reliable single-vendor support
- Easy, affordable scalability

## Valero Energy Lowers Web Site Maintenance Costs, Increases Security and Scalability

“It takes weeks instead of months to launch Web-based marketing campaigns. ... Having a nimble, responsive Web environment helps Valero be more responsive to market dynamics.”

Peter Ray, Senior Manager, Technology Assessment and Development Services,  
Valero Energy Corporation

Valero Energy Corporation, one of the top refining companies in the United States, wanted to move its corporate Web sites off the Linux operating system and Apache Web server, which consumed far too much IT staff time, didn't allow easy scaling, and were vulnerable to security breaches. With the help of Microsoft® Gold Certified Partner Catapult Systems, Valero migrated two sites to Microsoft Windows Server™ 2003 and Content Management System 2002, both part of Microsoft® Windows Server System™ integrated server infrastructure software. Marketing and human resources staff now can make content changes in minutes without IT assistance, and site maintenance takes a quarter of the time it used to. The sites are far more secure thanks to a wealth of built-in security features, as well as more scalable due to the ease of adding inexpensive servers.



## Situation

Valero Energy Corporation is a Fortune 500 company with 20,000 employees and U.S.\$38 billion annual revenue. The company has a refining system processing 2.4 million barrels a day, a 4,500-store retail service station network, and a growing pipeline and terminal business. The company's service stations operate under the brand names Diamond Shamrock, Valero, Total, Beacon, and Ultramar.

Valero is a longtime user of Microsoft® software with hundreds of Windows®-based servers running everything from messaging to system management software. However, in 2001, the company's corporate Web site, [www.valero.com](http://www.valero.com), was created by an outside consulting firm using a proprietary content management system and hosted on a Linux/Apache server. As time went on, the Linux-based Web site became a bigger and bigger headache.

First, the site was extremely difficult to update and maintain for the Windows-trained IT staff. "Everyone maintaining the site was skilled in Microsoft rather than Linux technologies, so no one wanted to work on the site," explains Peter Ray, Senior Manager of Technology Assessment and Development Services for Valero.

"The Linux platform was a lot more work without providing a lot more value," Ray explains. "Even the smallest site changes required IT involvement, because the content management tool was too difficult for marketing people to use. IT had to hand-code everything using Macromedia Dreamweaver or Perl scripts, which was extremely time consuming. Because no one person in IT knew all the required technologies, it took multiple people to implement even the smallest change. Consequently, the Web site was a big drain on IT resources and a source of frustration for marketing and corporate communications

users, because changes took so long to implement."

The site also presented serious security vulnerabilities. Both the source code for the site and the back-end data repository (the open source MySQL) resided on a server outside the Valero firewall. "Because we are a Microsoft shop, no one on staff knew how to create a distributed, secure Web model in Linux," Ray says. "A couple of years ago, we experienced a security breach and the destruction of quite a bit of content on our Web server. We could easily have prevented this in a Windows-based environment."

Lastly, the site was difficult to scale because load balancing with Linux was far more difficult to do than it is with the Windows operating system. "Load balancing is built into Windows but is very complex to implement in Linux," says Shane Garza, Technical Analyst at Valero. "More people wanted to post content to the site, but we were running out of computing power and database capacity. We were also running out of patience."

## Solution

In 2002, Valero Energy spun off its pipeline assets into a separate holding company called Valero LP. Valero Energy brought in Microsoft Gold Certified Partner Catapult Systems to create a separate Web presence for the new company.

Catapult encouraged Valero to test Microsoft Content Management Server (MCMS) 2002, part of the Microsoft Windows Server System™ integrated server software, for the new Web site. Built on Microsoft .NET-connected technology, MCMS is a complete Web content creation, deployment, and maintenance solution that dramatically streamlines the Web publishing process. Valero agreed to give MCMS a try and hired Catapult Systems and Microsoft Consulting

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Services to design the Valero LP Web site and set up the initial Web page templates.

About this time, Valero Energy experienced the above-mentioned security breach on its corporate site and decided to migrate that site ([www.valero.com](http://www.valero.com)) to Microsoft technologies as well. Catapult Systems transferred all graphics and used a site-scraping tool to quickly capture other content from the old site and move it to the new site on two load-balanced Web servers running the Microsoft Windows Server™ 2003 operating system with Internet Information Services (IIS) version 6.0. The database server uses Microsoft SQL Server™ 2000 as the data repository.

Windows Server 2003 and SQL Server 2000 are both part of Windows Server System. By migrating to Windows Server System, Valero was able to make use of all the system management tools that it had in place for managing Windows-based servers, which it could not do with the Linux/Apache system. This included the ability to closely monitor the SQL Server database.

Catapult Systems also gathered end-user requirements and performed necessary coding. Total migration time was less than two months, including the time required by IT staff to learn Content Management Server.

#### **Database Built for Web Work**

Valero is finding SQL Server well suited to its Web environment. “Compared with MySQL, SQL Server is very easy to install,” Garza says. “SQL Server 2000 supports views and stored procedures, whereas MySQL does not.”

Views can be used to simplify commonly accessed parts of a highly normalized database or to give certain users access to certain pieces of data without disturbing the data normalization. SQL Server also supports

an indexed view of data, which is essentially a faster version of the original.

When designing software of any significant size, the first step often is to separate data manipulation logic from business logic. SQL Server stored procedures give the programmer the option to place data manipulation and bookkeeping logic into the database instead of mingled with the code where it requires programmer intervention and a fresh deployment to all the users when an adjustment is made.

MySQL has a 1-megabyte limit on the size of multimedia files (images, documents, audio files, and so on), while the SQL Server limit is 2,000 times larger at 2 gigabytes. “This difference is significant when trying to implement content management,” Garza says. “With MySQL, you can’t store the multimedia files in the database. Once you are outside the database sandbox, you have to worry about file name collisions and data integrity. It’s up to the programmer to manage problems such as a file getting accidentally deleted or corrupted.”

#### **“The Best Windows Ever”**

Catapult Systems uses the Windows XP Virtual PC (VPC) feature to test Web sites. “With enough RAM, you can create virtual computers on one system,” says Darryl Agostinelli, Consultant at Catapult Systems. “We can configure Content Management Server, a domain controller, a Web server, and a workstation on one laptop for tests and demonstrations.”

Austin, Texas-based Catapult Systems uses the Terminal Server engine in Windows Server 2003 to remotely access Valero servers for monitoring and troubleshooting—without the need to send a technician to the Valero data center in San Antonio, Texas. Remote access capabilities help Catapult

reduce service and support costs and solve customer problems faster.

The Web team was one of the first to deploy Windows Server 2003 at Valero. "I've been involved with Windows since Windows 3.1, and Windows Server 2003 is the best Windows ever," Ray says. "The performance is better, and I really like the ability to take applications and put them in dedicated application pools. If one application has a problem, it doesn't affect the other applications on the server. You can simply recycle the failed application or IIS without rebooting the server. This has greatly reduced the amount of server management work."

The IIS 6.0 application isolation feature supports easier Web server management. "IIS is configured in an XML file that can easily be copied to all servers in a Web farm," Garza says. "The number of reboots required is drastically reduced. In fact, since the site was launched, there has been no unscheduled downtime on this server. The only reboots that are required are the scheduled weekly reboots for the installation of system and security patches."

### Benefits

With Valero's new Web environment, marketing and human resources (HR) staff can post content changes without IT involvement, freeing IT resources to work on tasks other than Web support. The comprehensive content management solution has enabled Valero to protect its Web assets and receive support from one stable, reliable vendor.

#### **Fast, Easy Content Authoring**

Microsoft Content Management Server 2002 has a built-in authoring tool that uses a Microsoft Word-based interface and is accessible through a browser, greatly simplifying template creation and routine content updates.

"We like the fact that MCMS is Microsoft .NET-based, which allows us to use object-oriented code and therefore write much less code," Agostinelli says. "The application programming interface handles a lot of the work for you. I can create really sophisticated and dynamic Web navigations, a site map, or a search page using very little code. In fact, when I use MCMS, I'm almost writing myself out of a job. I can create the core of a large, complex Web site that does just about everything, with just two weeks of development. The same job would take months using other content management systems."

Building a new page template now requires only minutes. Garza simply takes an existing template and modifies it. "The power of MCMS is that it leverages our staff's familiarity with the Microsoft Visual Studio® development system and the Active Directory® service," Ray says. "The programming paradigm is the same, so the learning time is very short."

End-user training on the MCMS authoring tool took just an hour. Valero corporate communications, marketing, and HR staffs can make routine changes themselves using any Web browser. When they need to synchronize time-critical Web content with press announcements, for example, content authors use the MCMS auto-publishing feature to set an activation date and time at which content becomes live.

HR staffers now are able to post job openings on the Web themselves and keep job listings up to date without the time lags that occurred previously when everything had to go through the IT staff. Marketing staffers find campaigns easier to implement.

"Because time-to-market with new content is so much shorter, it takes weeks instead of months to launch Web-based marketing campaigns," Ray says. "We've also been able

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to eliminate the costs and delays of printing and mailing marketing materials, because now we can deliver them through the Web. Having a nimble, responsive Web environment helps Valero be more responsive to market dynamics and customer demands.”

#### **25 Percent Less IT Maintenance**

Moving to the new content management solution has freed significant IT resources at Valero; at least two people have been redirected to tasks other than day-to-day support of the corporate Web sites. “Maintenance takes a quarter of the time it used to on Linux,” Ray says. “There’s no need to hand-code every single change. One staff person maintains two Web sites while working on other projects.”

#### **Tighter Web Security**

Using the Active Directory and IIS 6.0 technologies in Windows Server 2003, Valero has created a highly secure Web architecture. The company’s two load-balanced Web servers sit in a “demilitarized zone” (DMZ) that is outside the company firewall and accessible to the outside world. However, they are protected by Microsoft security features that include a fault-tolerant architecture and aggressive security defaults.

For example, in the Web Edition of Windows Server 2003, most of the system components not directly required to support Web server processing are disabled. This makes the system more secure because there are fewer active components to compromise.

The authoring server and database server sit inside the company firewall and are protected by Active Directory password authentication. Authorized users log on to the authoring server through the corporate local area network (LAN) to make changes and post new content. The LAN directory communicates with the DMZ directory to allow new content to be posted by authorized users.

“Our Web servers in the DMZ are super-secure,” Garza says. “Nothing touches our production servers. Nightly, the authoring server communicates with the database servers and automatically transfers any new content. We don’t have to dump the whole database, which is a big time savings.”

With the two-node Web server design, Valero can apply “rolling” security updates during the workday by taking one server offline, applying the patch, returning that server to service, and then taking the other server offline for updating. “Our Web servers are never down, yet they’re always up to date,” Ray says. “Planned server downtime is completely transparent to our Web visitors and end users.”

#### **Reliable Single-Vendor Support**

After designing its security architecture, Valero had Microsoft Premier Support perform a security review of the entire site (and it passed with flying colors). “We couldn’t get that kind of service with a Linux solution, because there’s no one to call,” Ray says. “With Microsoft, we know we have one vendor to turn to when we need help. With open source solutions, you don’t know who to call.”

#### **Easy, Affordable Scalability**

Valero’s two load-balanced Web servers give the company greater scalability to handle both gradual increases in site traffic and sudden traffic spikes. “We couldn’t scale the Linux server,” Ray says. “Windows-based servers are less expensive to buy and far easier to set up than Linux systems. We have two Web nodes now but it will be very easy to add a third.”

#### **Plans for the Future**

The migration of Valero’s two Web sites was so successful that the company is getting ready to migrate its third-largest Web property, [www.ultramar.ca](http://www.ultramar.ca), belonging to its Canadian subsidiary, to the same solution.

## For More Information

For more information about Microsoft products and services, call the Microsoft Sales Information Center at (800) 426-9400. In Canada, call the Microsoft Canada Information Centre at (877) 568-2495. Customers who are deaf or hard-of-hearing can reach Microsoft text telephone (TTY/TDD) services at (800) 892-5234 in the United States or (905) 568-9641 in Canada. Outside the 50 United States and Canada, please contact your local Microsoft subsidiary. To access information using the World Wide Web, go to: [www.microsoft.com](http://www.microsoft.com)

For more information about Catapult products and services, call (512) 328-8181 or visit the Web site at: [www.catapultsystems.com](http://www.catapultsystems.com)

For more information about Valero Energy products and services, call (210) 370-2000 or visit the Web site at: [www.valero.com](http://www.valero.com)

“The Ultramar site is bilingual, so we’ll be able to use the Content Management Server multilanguage capabilities and save quite a bit of time,” Ray says.

Valero has additional plans for its new content management solution. “We also want to do more business-to-business kinds of things over our sites, such as offering pricing information to commercial customers—MCMS will really help with that,” Ray says. “Content Management Server and Windows Server have given us a foundation that will allow us to take our Web properties in any direction without a lot of development effort, cost, and security worries.”

## Microsoft Windows Server System

Microsoft Windows Server System is a comprehensive, integrated, and interoperable server infrastructure that helps reduce the complexity and costs of building, deploying, connecting, and operating agile business solutions. Windows Server System helps customers create new value for their business through the strategic use of their IT assets. With the Windows Server operating system as its foundation, Windows Server System delivers dependable infrastructure for data management and analysis; enterprise integration; customer, partner, and employee portals; business process automation; communications and collaboration; and core IT operations including security, deployment, and system management.

For more information about Windows Server System, go to: [www.microsoft.com/windowsserversystem](http://www.microsoft.com/windowsserversystem)

### Software and Services

- Products
  - Microsoft Content Management Server 2002
  - Microsoft SQL Server 2000
  - Microsoft Windows Server 2003, Enterprise Edition and Web Edition
- Technologies
  - Active Directory
  - Internet Information Services
  - Microsoft .NET Framework

### Hardware

- One HP DL380 database server
- One HP DL380 authoring server
- Two HP B10 blade servers

### Partners

- Catapult Systems

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