



Customer Solution Case Study

**Customer:** Costco Wholesale Corporation**Web Site:** www.costco.com**Customer Size:** 130,000**Country or Region:** United States**Industry:** Retail—Wholesale and distribution**Customer Profile**

Costco Wholesale Corporation is an international wholesale distributor based in Issaquah, Washington. Costco has 539 member warehouses and 130,000 employees.

Software and Services

- Microsoft Server Product Portfolio
 - Windows Server 2008 Enterprise
 - Windows Server 2008 Hyper-V
 - Microsoft System Center Virtual Machine Manager 2008
- Services
 - Microsoft Services

Hardware

- HP ProLiant DL380 G5 servers
- Quad-Core Intel Xeon processors

For more information about other Microsoft customer successes, please visit: www.microsoft.com/casestudies



Costco Uses Virtualization to Save Space, Reduce Costs, and Increase IT Agility

"We love virtualization! We now have the ability to set up test and development systems quickly, and we can be as nimble as the business needs."

Liz de Michele, Manager of Server Technologies/Corporate Applications, Costco Wholesale Corporation

Costco Wholesale Corporation is a major international wholesale distributor with revenues approaching U.S.\$70 billion. Costco began using virtualization technology in 2006 and has expanded its investment to include Windows Server® 2008 Enterprise with Hyper-V™ and Microsoft® System Center Virtual Machine Manager 2008. With these tools, Costco can control IT spending, increase IT flexibility, and manage its virtualized server assets more efficiently.

Business Needs

Costco Wholesale Corporation, based in Issaquah, Washington, operates member warehouses where 51.8 million business and individual cardholders can purchase brand-name merchandise at prices substantially lower than those found at traditional retail and wholesale outlets. Since opening the first Costco warehouse in 1983, the chain has grown to achieve annual revenues of U.S.\$70 billion, with 130,000 employees and 539 outlets throughout the United States, Japan, Korea, Taiwan, Mexico, Canada, and the United Kingdom.

The complexity of the Costco IT infrastructure has grown along with the business. In addition to the warehouses, the company maintains eight domestic and seven international offices, and the company's worldwide network includes 13,000 HP Neoware thin client computers and nearly 9,000 end-user computers. The corporate data center in Issaquah is home to 1,200 servers and a series of AS/400 mainframe computers.

By 2006, Costco realized that it needed to

control the proliferation of servers in the data center. Following an initial investment in Microsoft® Virtual Server 2005, Costco consolidated servers and enabled its application groups to more easily perform testing and validation before rolling out new software solutions. “At first, virtualization was mostly to reduce the server footprint,” says Liz de Michele, Manager of Server Technologies/Corporate Applications at Costco Wholesale Corporation. “But over time it has become much more about utilizing our assets as fully as we can.”

Costco has made significant efforts to develop a virtualization strategy and is interested in continuing to explore other options that will expand its investment.

Solution

Costco has a significant investment in Microsoft products—95 percent of its data center computers run versions of the Windows® operating system. So when the company heard about the Windows Server® 2008 operating system with Hyper-V™ virtualization technology and Microsoft System Center Virtual Machine Manager 2008, it enrolled in the Microsoft Virtualization Rapid Deployment Program (RDP) as the next step in its virtualization plan.

Before physical-to-virtual (P2V) conversions began, Costco IT staff used the Microsoft Assessment and Planning (MAP) Toolkit to evaluate server loads. “It’s a good tool to have to help gauge what you can virtualize,” says Jason Griffith, Analyst at Costco Wholesale Corporation. Using the toolkit, staff members discovered that, in many cases, servers were running at only 5 percent utilization, making them good candidates for consolidation. Costco now runs Hyper-V on five servers in the

data center on HP ProLiant DL380 G5 servers with Quad-Core Intel Xeon processors. The server cluster has a core infrastructure that mimics the production Costco environment, and the five physical servers host 50–60 virtual machines that run domain controllers, Microsoft Exchange Server, and infrastructure applications.

With expert help from Microsoft Services, IT staff members integrated Hyper-V into their internal application development and quality assurance (QA) process to verify reliability and stability before rolling out new systems to internal customers and member warehouses. IT staff will also use Hyper-V to do anti-virus testing on application servers without compromising the security or stability of the physical systems by installing software or agents on production machines.

The ease of doing P2V conversions with System Center Virtual Machine Manager 2008 resulted in a smooth evaluation process. “It’s been great,” says Griffith. “Once we were able to attach SAN storage and cluster the Hyper-V host servers, it ran very well.”

Benefits

With Hyper-V and System Center Virtual Machine Manager 2008, Costco can consolidate servers, reduce costs, increase IT flexibility, and more easily manage virtualized systems.

Decreased Server Footprint

By virtualizing existing servers instead of purchasing new physical machines, Costco limited the proliferation of servers in its data center. The IT staff aims to achieve 20 percent virtualization by the end of August 2008 and 40 to 45 percent virtualization by the end of August 2009.

Reduced IT Costs

Costco reduced spending on new physical servers and expects to cut data center energy expenses, which cost the company \$75,000 a month. Hyper-V virtualization technology is also much more affordable than other solutions. “The solution allows us to deepen our partnership with Microsoft and leverage our existing technology investment,” says Sharon Wagner, Director of Client/Server Technologies at Costco Wholesale Corporation.

These savings help Costco remain competitive in its industry. “The biggest way we’re set apart from our competitors is that we spend so much less on IT than they do,” says de Michele. “Virtualization enables us to do this.”

Increased IT Flexibility and Responsiveness

Costco uses virtualization to streamline testing and development for corporate applications. This redirects valuable IT time to better serve internal customers, and the staff appreciates the increased flexibility. “We love virtualization!” says de Michele. “We now have the ability to set up test and development systems quickly, and we can be as nimble as the business needs.”

Easier Virtualization Management

Costco runs its Hyper-V–based server cluster at a ratio of 10 virtual machines per physical host and hopes to increase that number to 15–20 virtual machines. This high-server density is a feature the company appreciates. “We can accommodate more guests per host,” says de Michele. “That gives us less overhead and is easier to manage.”