

# SERVER CONSOLIDATION AND DISASTER RECOVERY

## 2005 COMPUTERWORLD HONORS CASE STUDY

### FINANCE, INSURANCE & REAL ESTATE

THE FOURTH LARGEST MUTUAL LIFE INSURANCE COMPANY IN THE U.S. INTRODUCED A NEW ROBUST, RELIABLE IT INFRASTRUCTURE TO ACCOMMODATE ITS LARGE CURRENT BUSINESS AND EXPECTED GROWTH BY BUILDING A VIRTUAL INFRASTRUCTURE, CONSOLIDATING HUNDREDS OF SERVERS, INCREASING PERFORMANCE AND CAPABILITIES, AND SIGNIFICANTLY LOWERING COSTS. [20055357]



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## SUMMARY

The fourth largest mutual life insurance company in the U.S., Guardian required a robust, reliable IT infrastructure to accommodate its large current business and expected growth. The company built a virtual infrastructure, consolidating hundreds of servers, increasing performance and capabilities, and significantly lowering costs.

## APPLICATION

Providing insurance and financial products for individuals, businesses and their employees, Guardian needs an efficient, reliable IT infrastructure; Guardian's systems cannot go down. To protect valuable data and applications, Guardian created a VMware virtual infrastructure, consolidating and migrating servers, and ensuring optimized server management. Guardian also tested and set up a disaster recovery plan to ensure rapid restoration of virtual machines in the case of a disaster.

In late 2000, Guardian began planning to retire servers. Guardian had hundreds of servers hosting single applications and running at very low utilization rates. The applications, performing back-office tasks such as life insurance application processing and account inquiry and management, ran on the Windows NT 4.0 operating environment. Most of them were developed years ago and no longer had documentation or installation files in existence. Many also had memory leaks.

Guardian was also outsourcing some of its development to offshore partners. Security Exchange Commission and Guardian Board of Directors mandates required a solution that would keep confidential information and proprietary code within the United States. Supporting a growing number of development tools and developers became increasingly problematic, as Guardian needed to guarantee quality as well as full compliance with regulations.

After evaluating possible solutions, Guardian turned to virtualization technology to meet its server consolidation needs and to standardize its development platforms. VMware GSX Server and ESX Server would allow many virtual machines to run on each physical server, with single applications contained within the virtual machines. The isolation property of virtual machines meant applications could share server resources without conflict.

In June 2001 Guardian began migrating servers from unsupported hardware. Using VMware P2V Assistant, Guardian was able to migrate machines in hours, rather than the weeks or months it would have taken to re-install applications and rebuild systems. The migration tool also lowered the risk of accidentally corrupting applications.

Guardian was also able to create an optimized developer environment by consolidating its hundreds of development servers on ESX Server. Each developer has his own secure desktop running on a VMware virtual machine, which gives each developer remote access to his work.

Guardian has continued to build its virtual infrastructure, realizing that in addition to solving its server consolidation and development needs, the technology increased their server management capabilities while reducing costs. Guardian uses virtualization software throughout the company to quickly and easily deploy new servers as needed for test, development and production.

Guardian also began using VMware VirtualCenter when it was released in 2003 to control virtual machines across many physical servers from one centralized point. Guardian also uses VMotion, to move virtual

machines across physical servers without interrupting their operations.

Guardian was also able to set up reliable disaster recovery for its systems, creating a data center matching its production environment. The ESX Servers in production are connected to an EMC DMX SAN. Using SRDF functionality with VMware, Guardian is able to provide business units with reliable disaster recovery; in the event of a disaster, systems can be recovered in hours instead of days.

## **BENEFITS**

Guardian achieved a large number of benefits from its virtual infrastructure, including:

- **Cost Savings.** Guardian was able to decrease its spend on new hardware. Other cost savings include reductions in memory, disk and CPU upgrade costs, and reduced spend on environmental items such as cooling, physical space, power, cabling and keyboard/video/mouse (KVM).
- **Server Consolidation.** Guardian hosts 20-30 virtual machines on each physical server. As of this report, Guardian is currently running over 500 virtual machines, without VMware ESX server these all would be running on individual specific hardware, instead these 500 machines are running on just 20 physical servers.
- **Increased CPU Utilization.** Servers migrated to virtual machines were under 15 percent utilized, whereas hardware running VMware virtual machines is utilized 50-80 percent.
- **Centralized Server Management.** Using VirtualCenter, Guardian is able to manage its server resources and control server access from a single centralized point.
- **High Performance.** Instead of buying smaller servers to house individual applications, Guardian invests in high-end, reliable servers to host its virtual machines, ultimately boosting application performance.
- **Time Savings for Server Procurement.** Instead of needing to wait weeks to order and procure new hardware, and then spend hours setting it up, Guardian is able to deploy new virtual machines in minutes. With Virtual SMP, upgrading memory and CPU takes only minutes. Because of the virtualization layer, there is no need to update server images for new hardware requiring different drivers, so Guardian is able to have standard builds instead of needing to change due to differences in hardware.
- **Optimized Development Environment.** Currently, Guardian has about 200 developers using virtual machines hosted on six ESX Server instances. Each developer has his own secure desktop running on a VMware virtual machine, which gives each developer remote access to his work.
- **Disaster Recovery Solution.** Each ESX Server instance is connected to an EMC DMX SAN with SRDF between the main data center in Pennsylvania and the disaster recovery site in Massachusetts. This provides business units with a quick recovery time for their production environments

## **IMPORTANCE**

For Guardian, responsiveness, high availability, disaster recovery, efficiency, scalability are crucial in IT to protect company and customer data and applications. Also, the events of 9/11 underscored the importance of having effective disaster recovery.

To address this, Guardian embraced virtualization technology from VMware to create a streamlined, responsive IT infrastructure. Key IT aspects include:

-VMware P2V Assistant allowed Guardian to quickly migrate older servers to virtual machines on newer hardware, with little downtime. The applications running on better hardware has brought a great increase in performance.

-ESX Server enables Guardian to consolidate mission-critical applications and infrastructure services, such as utility servers, including Domain Controllers, DNS, WINS, and DHCP, Web servers, such as IIS, APACHE, and database servers, such as Microsoft SQL and Oracle, onto fewer highly scalable, reliable enterprise-class servers.

-Using VirtualCenter with ESX Server allows Guardian to respond faster to business demands with instant provisioning of virtual machines and dynamic resource allocation to those virtual machines as business needs change.

-VMware SMP allows Guardian to upgrade disk, memory and CPU in minutes

-VMware virtualization layer eliminates the need to update server images for new hardware requiring different drivers

-VMotion allows Guardian to perform zero-downtime maintenance on live systems without interrupting service.

-EMC DMX SAN connected to each ESX Server with SRDF between the main data center and the disaster recovery site ensures speedy recovery in the case of a disaster.

## **ORIGINALITY**

Guardian's pioneering enterprise-wide VMware software implementation broke new ground on many levels:

For the server consolidation and management project:

- Guardian migrated hundreds of applications from physical servers to virtual machines in a short timeframe
- Guardian is one of the first large companies to employ more than 500 virtual machines across the enterprise, in Production, QA, Testing and Development
- Guardian was able to provide remote access for developers while complying with regulatory mandates

for the Disaster Recovery project:

- When DR became a higher priority after September 11, 2001, Guardian foresaw that virtualization technology combined with rapid storage replication could enable frequent point-in-time server images, and synchronize them between datacenter locations
- Guardian worked with VMware and EMC to achieve certification from software vendors for running their applications in virtual machines
- Guardian rigorously tested the solution to ensure its reliability
- Now, production servers are continuously backed up on the SAN
- In the event of a disaster, Guardian can restore its entire data center in a few hours. In contrast, most companies restore on tape, requiring at least two to three days recovery time.
- Instead of outsourcing, Guardian worked with VMware and EMC to build its own solution

## **SUCCESS**

Guardian has continued to extend the scope of its virtual infrastructure because results have exceeded expectations. Originally planning a server consolidation project, Guardian found that VMware software saved large amounts of money, sped application deployment, increased performance and optimized server management. As a result, the company has added to its virtualization infrastructure, most recently building a disaster recovery solution based on the technology along, with storage hardware from EMC.

Employees and customers are also benefiting from the virtual infrastructure. IT administrators at Guardian can manage a large number of servers more efficiently, balancing resources to requirements and quickly deploying new virtual machines. With the new disaster recovery solution, Guardian can rely on the automatic failover capabilities and better point-in-time images. In the event of a disaster, systems can be restored in hours instead of days.

Guardian is continuing to expand its use of virtualization technology, adding virtual machines to its environment, and planning the use of new VMware products. Guardian is currently considering VMware ACE to provide a secure and managed desktop for users that work from home, offshore and for disaster recovery.

## **DIFFICULTY**

There were several challenges during the project:

- Guardian faced the challenge of consolidating hundreds of servers running legacy applications that needed a dedicated server. The team was able to use VMware P2V Assistant to migrate these applications quickly and efficiently. With P2V Assistant, it took only hours, and the systems and configurations were preserved as-is.
- Guardian faced the obstacle of needing to migrate mission-critical data in a limited amount of time
- Because Guardian was one of the first large deployments, early on, vendors were not familiarized with VMware software; some had concerns about supporting their tools in a virtual machine environment. However, as the market adapted, support spread quickly.
- Developing a new method of disaster recovery, including instant replication, demanded vision, a large amount of testing, plus work with vendors for certification.
- Rather than outsource their DR solution, Guardian planned their own deployment relying only on internal staff, existing vendors and resources

