

# First Marblehead Corporation

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Director of System Engineering  
First Marblehead

### HIGHLIGHTS

#### Challenge

To support the company's rapid growth, First Marblehead wanted to switch to a secure off-site datacenter, but was faced with a short planning and execution window and the challenge of securely moving approximately 100 terabytes of data.

#### Solution

VMware Professional Services provided:

- Datacenter migration plan that covered the entire virtual infrastructure from development to QA, staging, production and disaster recovery. Included Architecture design and Migration and Test Plans
- Physical to virtual (P2V) migration
- Disaster recovery workshop and demonstration
- Best practices and knowledge transfer

#### Results

- Installed, on-site, 20 ESX hosts and two VirtualCenter Servers
- Met 90-day company planning window and 24-hour migration window with time to spare, migrating 45 systems to a new hosted datacenter in just three hours
- Minimized website downtime and disruption to customers
- Enhanced security of sensitive financial data Reduced corporate headquarters dependency on physical location of its datacenter

#### VMware at Work

- VMware Virtualization
- vCenter 1.x
- VMware ESX 2.5.x

## First Marblehead Teams with VMware Professional Services to Migrate a Datacenter without Lifting a Server

VMware Professional Services helps First Marblehead develop and execute plan for successful datacenter migration utilizing virtualization.

### Project Summary

Headquartered in Boston, with major datacenters in Bedford and Medford, Massachusetts, First Marblehead helps meet the growing demand for education loans by providing an integrated suite of customized design, implementation and securitization services for private student loan programs. In fiscal 2007, the company facilitated 1.3 million loan applications and approximately \$4.3 billion in loan disbursements that funded students at more than 5,800 schools—from private K-12 schools through undergraduate, graduate and continuing education programs. Due to the sensitivity of the financial information it handles—and a desire to retain flexibility in adding and moving office locations—First Marblehead wanted to switch to a secure off-site datacenter. But moving approximately 100 terabytes of data posed a major challenge and presented a serious risk.

VMware Professional Services helped First Marblehead develop and execute a plan for moving data from its primary datacenter in Medford, Massachusetts to a new facility in Bedford, Massachusetts. As part of this major relocation effort, VMware Professional Services guided First Marblehead's team through the engineering tasks needed to move the 45 virtualized systems that support the company's websites and other business-critical applications. Thanks to the product knowledge and problem-solving ability of VMware Professional Services, First Marblehead migrated its virtual datacenter without physically moving a server—completing the cutover in just three hours.

#### First Marblehead's Migration Environment

- Virtualization: VMware Virtualization, VirtualCenter 1.x and VMware ESX 2.5.x
- Server: HP DL 580
- Storage: EMC Clarion and Symmetrix DMX
- Backup: Symantec NetBackup

### Data Center Migration Presents Time Crunch

When First Marblehead recently went through a period of rapid growth, the company realized that its datacenter might be holding it back—but not for the reasons one would expect. The company was not running out of servers or power, but executives worried that maintaining a datacenter at company headquarters would limit First Marblehead's geographical flexibility.

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“We were growing phenomenally at that point, and no one could project what our facilities requirements were going to be,” recalls Peter Krockta, Director of System Engineering at First Marblehead. “Our intent was to impart as much flexibility as we could into that decision process by separating our people from the datacenter to the largest extent possible.”

First Marblehead's CIO devised a plan to migrate the company's primary datacenter in Medford, Massachusetts to a hosted facility outside Bedford, Massachusetts. The new facility would not only free up hands at First Marblehead's headquarters, but also provide a greater level of security for the highly sensitive loan documentation information that the company handles.

The plan called for First Marblehead to move all of its production systems to Bedford, and to use the existing Medford facility for backup, disaster recovery, development and quality assurance. But along with the physical effort and data loss risk that any datacenter migration brings, the project came with a tight timeline: First Marblehead had only a 90-day window to plan the project, and needed to complete the actual move within 24 hours to minimize business impact.

The company realized that physically moving the 45 Windows machines that supported its website and other business critical applications would present a significant risk of damage and data loss as well as costly downtime.

“Like many financial services providers, our business revolves around our ability to service the customer,” Krockta explains. “To minimize the appearance of downtime and the disruption to our current and future customers, we wanted to keep our website live during the move and just cache up the requests that came in. But we had about 75 Windows systems supporting our website that we would need to shut down and move as quickly and smoothly as possible. That's not a trivial exercise.”

### **Expert Consultants Guide Project Team To Success**

First Marblehead decided to streamline the migration by expanding its use of virtualization technology. The company had been a VMware customer since early 2005 and anticipated that virtualization would enable a fast, easy cutover from one production datacenter to another. During the project, First Marblehead also hoped to build a staging environment for development and quality assurance testing, and to upgrade its existing staging area. For several months in late 2007, the company discussed how it would extend its VMware implementation to the production environment.

That's when First Marblehead turned to VMware Professional Services for help. In February 2008, First Marblehead engaged VMware Professional Services to plan and execute its datacenter migration. According to the agreement, one VMware consultant would handle all engineering details, while several others would address various issues as needed. Including First Marblehead personnel, the full-time project team included just four people.

“VMware Professional Services helped us pull off a major datacenter migration with a very lean team,” says Krockta. “The consultant who handled our engineering tasks contributed dozens of innovative ideas for solving problems and leveraging the VMware platform. Once we had decided how to use VMware technology in our datacenter migration, our VMware consultant worked out all the engineering details to make it happen flawlessly. That made our job so much easier on the night of the move.”

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## Step-By-Step Plan Prepares Data Center For Speedy Migration

Working closely with VMware Professional Services, First Marblehead followed a straightforward step-by-step migration process. VMware consultants kicked off the process by interviewing First Marblehead staff to determine the ideal blueprint for the new virtual infrastructure. Because First Marblehead had been running an older version of VMware Infrastructure, VMware consultants planned to upgrade the company to version 3.5 as part of the migration.

With the blueprint in hand, First Marblehead’s project team set aside a space in the Medford datacenter to build an environment that would mimic the configuration and performance of the new Bedford facility—and would eventually be moved, via virtualization, to the new site. This staged datacenter included four VMware ESX hosts for production, three for quality assurance, four for staging and four for development. VMware consultants cabled all of the servers based on the plan they developed for First Marblehead—a plan that went beyond the scope of the move to cover the entire virtual infrastructure from development to QA, staging, production and disaster recovery.

Next, the team performed a physical-to-virtual (P2V) migration that created 45 virtual machines—representing several terabytes of data and about one-third of the company’s Windows environment. First Marblehead placed these virtual machines into the staging environment, allowing the quality assurance and user acceptance teams to validate their performance before the actual migration.

Meanwhile, First Marblehead’s network team worked at the Bedford facility to build a production collocation facility that included physical servers. They brought over network switches and configured the entire network environment in anticipation of transporting the last four VMware ESX hosts to Bedford.

## Eight Weeks Of Careful Planning Result In A Three-Hour Migration

After eight weeks of planning and preparation, moving day arrived. The project team shut down all systems in Medford, gracefully turned off all virtual machines and began a brief outage period during which First Marblehead failed over to its DR facility. The team also unregistered all virtual machines that were to be moved and halted replication between the company’s two EMC storage units—one in each datacenter.

By this time, several VMware ESX machines were already set up in the Bedford datacenter. With the help of EMC personnel, the team performed a failover of the EMC Symmetrix storage system. Next, they configured one VMware ESX host in Bedford, disabled resignaturing, and began to rename the datastores. The team then rescanned all remaining ESX hosts and verified that all datastores were visible before reregistering all virtual machines from each datastore. Finally, the team ran scripts that would remount all the virtual machines, bring them into the virtual machine inventory and power them on in a predetermined sequence. This gave the QA and user acceptance testing teams a chance to begin testing the machines.

“Since we had built the new datacenter in a virtualized staging environment and just shipped the data over, we didn’t have to deal with any changes of network configuration,” says Krockta. “The machines were already built as if they were sitting in the new site, with the right network, domains, names, addresses and host names.

The move began at 6 p.m. Just two hours later, virtual servers were up and being tested in Bedford. At 9 p.m., the project team began celebrating their accomplishment of moving 45 systems in three hours.

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“We had a 24-hour window to execute the datacenter cutover, but thanks to VMware virtualization technology, we didn’t need anywhere near that long,” says Krockta. “By the time we finished our end of the migration and started eating pizza, the other infrastructure teams were still uncabing boxes to move them down to the trucks. That’s a testament to the planning that VMware Professional Services put into this move.”

As a final step, the project team replicated all systems back to Medford for disaster recovery purposes. The team also redeployed “swing” servers from the staging area to support a production application at the Medford site.

### **Project Delivers Reliable Results**

All in all, First Marblehead’s migration lasted just eight weeks from start to finish.

“We felt some anxiety,” Krockta admits. “We like to minimize our risks, and we didn’t want to do anything that carried a risk of data loss. But it all went so quickly, and so smoothly, that we now wish we could have done more P2V migrations ahead of time.”

Although the project included an upgrade to VMware Infrastructure version 3.5, it finished on time and slightly under budget—thus meeting lofty expectations.

“Everyone here was already aware of the benefits VMware virtualization technology brings,” says Krockta. “So I can’t say we were surprised by the results, but we were certainly pleased.”

### **For More Information**

More information about VMware software and services can be found at <http://www.vmware.com> and from your local VMware representative.

