

# Raymond James Financial

## PROFILE

### RAYMOND JAMES®

#### Industry

Finance

#### Corporate Headquarters

St. Petersburg, FL

#### Employees

7,200 including affiliated, contractors, independent registered advisors and employees

#### Annual Revenue

\$2.979 billion

#### Website

<http://www.raymondjames.com/>

## THE NUMBERS

- 18,000 Microsoft Exchange 2010 mailboxes
- Virtualized deployment required six servers, instead of 40 for conventional environment

## IN BRIEF

### Objective

After successfully virtualizing its web server environment, Raymond James decided to begin virtualizing its tier one applications, starting with its Microsoft Exchange environment.

### Solution

Because stability and availability are critical, the company invested in careful planning and testing, leveraging VMware Professional Services and Technical Account Manager to assist. Once it had validated the design, it implemented a VMware vSphere™ infrastructure as the foundation for a major Exchange upgrade.

### Business Impact

- Exchange users continue to receive the highly available and stable applications services expected within this environment.
- Improved manageability allows maintenance to be performed without incurring outages.
- Raymond James better positioned to respond rapidly to new business needs such as acquisitions and expansions.

## Raymond James Extends Virtualization to Microsoft Exchange Environment

*“Microsoft Exchange is seen as a ‘canary in the coal mine’ when it comes to virtualization—one of the harder use cases. We’ve proven that peoples’ hesitation is unfounded. Exchange can be virtualized, it works, and it works well.”*

— Sue Werner, Systems Engineer, Raymond James

Like many companies that choose VMware® virtualization technology, Raymond James Financial began with a server consolidation project that achieved impressive results. By the completion of the initiative, the Florida-based diversified holding company had reduced its web server capital costs by 90 percent.

But this was only the start for Raymond James. When the company decided to upgrade from Microsoft Exchange 2003 to 2010, it again turned to VMware, this time to support the business-critical project of upgrading the company’s 18,000 Exchange mailboxes.

“We realized it was not a question of ‘should we virtualize our Exchange servers;’” notes Sue Werner, Systems Engineer, Raymond James. “The question was, ‘why wouldn’t we virtualize?’”

This proved to be the right question, and today Raymond James has demonstrated that virtualizing mission-critical applications makes as much sense as virtualizing lower tier systems.

### Trusting Virtualization for Mission Critical Applications

Microsoft Exchange applications are a critical and high-profile technology within Raymond James.

The company’s employees, affiliated financial advisors, and contractors provide investment and financial planning, asset management and investment banking services; collectively they manage about 1.9 million accounts across 2,300 locations in the United States, Canada, Europe and Latin America. They couldn’t do their jobs without the ability to communicate by email, manage their calendars and track tasks.

A stable and highly available Exchange environment is also important to Raymond James because the company operates in a highly regulated industry. It must ensure that its email servers meet mandatory governance and data security standards.

The company’s existing Exchange environment had become obsolete, however, and the storage hardware supporting the environment was reaching capacity. Raymond James needed to perform an upgrade. But because of the criticality of the environment, the company took great care in planning its migration to Exchange 2010. It retained trusted elements of its old Exchange architecture, such as a boot-from-SAN approach to enable speedy recovery in the event of server failure. Raymond James also kept VMware vCenter™ Site Recovery Manager as its disaster recovery and replication technology within its new Exchange blueprint. “We trust VMware SRM,” notes Werner, “and we wanted to retain the ability to easily swap out our hardware so that we can rapidly move our virtual machines to a new cluster if we need to expand.”

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*“VMware is a great partner. They had the resources, white papers, and guidance we needed both to validate our original design and support us along the way.”*

— Sue Werner, Systems Engineer,  
Raymond James

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Once the company had completed an initial design, it invited the VMware Professional Services Organization and Technical Account Manager program to perform an architectural review. The VMware Technical Account Manager was able to identify the right technical resources to review the scope of the project and guarantee a successful execution.

After performing the review, VMware engineers recommended a few modifications to the design to make it easier to expand the number of CPUs if needed and to optimize its LUN (logical unit number) disk configuration. “There was a significant value add to the VMware architectural review process,” notes Werner. “They caught issues early on, before we began building the environment, which kept downstream reconfigurations to a minimum. They also helped us feel more confident in our design decisions.”

## Choosing VMware HA Instead of Microsoft DAG

The finalized Exchange 2010 infrastructure is a VMware vSphere environment comprising two three-node VMware ESXi™ clusters running on HP ProLiant DL580 G7 servers. One cluster of three hub servers is located in the company’s primary datacenter in St. Petersburg, Florida; the other, with two hub servers, is located in a second datacenter in Michigan.

The Microsoft Exchange 2010 environment includes five client access servers and 10 mailbox servers; these are replicated across each of the two datacenters using VMware vCenter™ Site Recovery Manager . Each VMware virtualized machine within the mail server environment supports 1,700 users, with the capacity to grow to 2,100. Mailbox capacity is initially set at 250MB each, but this can be doubled in the future, if necessary.

The virtualized environment requires far fewer servers than would have been necessary had the team decided to remain with a conventional server platform. “We would have needed 40 physical servers,” Werner notes. “Instead, we required only six.”

In another key design decision, the team considered leveraging the Database Availability Group (DAG) technology, the clustering solution Microsoft introduced with Exchange 2010. Instead, it chose VMware High Availability (HA) technology. “We already use VMware HA,” Werner notes. “Retaining a high-availability solution that is familiar to us helped accelerate implementation. We avoided the learning curve associated with mastering new technology and configurations.”

Standardization was another factor in the decision to use VMware HA. “If we had chosen DAG, we would have needed new operational procedures,” says Werner. “Instead, our Exchange environment is consistent with the other business continuity processes established within Raymond James.”

Using DAG would also have required a larger environment: in all likelihood, Raymond James would have needed an additional 15 servers if they had decided to deploy DAG clustering.

## Performance Tests Validate Design

In the next phase of the Exchange upgrade project, the team built a test environment comprising one hub server and one mailbox server. Raymond James then brought back VMware engineers to oversee a series of performance tests. The engineers used Microsoft Exchange Server Jetstress and Load Generator (LoadGen) to simulate user connections and loads. The tests validated the design, demonstrating that the virtualized Exchange environment would support the fast application response times required by Raymond James users.

“Having VMware on hand to help with performance testing helped us keep to our launch schedule,” Werner notes. “It freed us to focus on other aspects of the rollout.”

## Manageability and Flexibility Support Business Agility

With the testing complete, Raymond James began the Exchange 2010 rollout. The company immediately began realizing the benefits of a virtualized Exchange environment.

One key benefit is manageability. The team uses the VMware Distributed Resource Scheduler (DRS) to dynamically allocate its mailbox server loads across its VMware ESXi hosts. This helps automate management tasks associated with load balancing, providing a resource-efficient way to support high availability.

Leveraging VMware vMotion® technology lets the team migrate servers between hosts so that maintenance tasks don't impact Exchange application availability. "We have so much more flexibility from an operational perspective," Werner notes.

Server reboots are so fast within the virtualized Exchange environment that the first time the team rebooted a server they thought the reboot hadn't occurred. "We were used to reboots taking 10 to 15 minutes, so when our VMware virtual machine came back so fast, it caught us by surprise," Werner says. Knowing that even reboots won't trigger service outages is huge for Werner's team. "If you have to reboot servers in the middle of the day and take 2,000 people offline, that's a significant operational issue," she notes. "Being able to have that server come back online quickly like that is definitely helpful. Today, our users generally don't even notice when we perform server maintenance."

Faster server reboots also means Werner's team can get more done during their maintenance windows. "Our maintenance window is only six hours to begin with," notes Werner. "Being virtualized definitely gives us more flexibility from an operational perspective." The infrastructure design delivers local fault tolerance. Should a motherboard or power supply fail, VMware vSphere would move the Exchange applications running on the affected server to another system. Application availability would be unaffected.

The new Exchange environment's disaster recovery (DR) processes have performed flawlessly as well, validating the data replication functionality of VMware Site Recovery Manager technology. "Our DR team runs tests every quarter," notes Lisa Huston, Senior Manager, Raymond James. "It isolates the secondary datacenter environment from the Internet and our primary datacenter, then brings it back up. In each test since we added our new Exchange environment, we were able to reboot the servers, bring them online, and send and receive mail." "Our team isolates our secondary datacenter and runs the Recovery Plan, which starts the protected virtual machines. In each test since we added our new Exchange environment, we were able to bring Exchange online, and send and receive mail."

The virtualized Exchange infrastructure is also highly scalable. "One of our overall goals is to support a more agile environment," Werner notes. "VMware virtualization allows us to scale up rapidly if the business requires it." Werner's team is therefore better prepared to accommodate Raymond James if it embarks on new corporate acquisitions or expansions.

The ability to better meet Raymond James' business needs is, in the end, the most important benefit of maturing the company's use of virtualization technology. "Right now, around 60 percent of our servers are virtualized," says Werner. "But our goal is to achieve 87 to 90 percent virtualization." This will include not only the company's Microsoft Exchange environment, but also other business critical systems such as its SQL Server databases. "Implementing our new Microsoft Exchange environment has further validated the benefits of VMware," Werner concludes. "It has enabled us to make significant progress toward our virtualization goal."

IMPLEMENTATION OVERVIEW		
<p><b>VMware Products:</b></p> <ul style="list-style-type: none"> <li>VMware vSphere 4.1</li> <li>Two three-node VMware ESXi clusters</li> <li>VMware vCenter Site Recovery Manager 4.1</li> <li>VMware High Availability</li> <li>VMware Distributed Resource Scheduler</li> <li>VMware vMotion</li> </ul>	<p><b>VMware Services:</b></p> <ul style="list-style-type: none"> <li>VMware Professional Services</li> <li>VMware Technical Account Manager</li> </ul> <p><b>Applications:</b></p> <ul style="list-style-type: none"> <li>Microsoft Exchange 2010</li> <li>Microsoft SQL Server 2005</li> <li>Microsoft Exchange Server Jetstress</li> <li>Microsoft Exchange Server Load Generator</li> </ul>	<p><b>Platform</b></p> <ul style="list-style-type: none"> <li>HP ProLiant DL580 G7 servers</li> <li>EMC Storage Area Network</li> <li>800GB Fibre Channel</li> </ul>

