

American Tire Distributors



“VMware technology helps us, as a business, support business growth. It has helped us evolve our IT infrastructure so that we can provide more dynamic computing. It has also enabled us to truly ‘think outside the box’ and find ways to deliver computing resources that drive the most value to our company’s bottom line.”

– Tony Vaden,
CIO, American Tire Distributors

KEY BENEFITS

Challenge

To support a business that is growing 10-20 percent annually, American Tire Distributors needs an IT infrastructure that can be scaled quickly to accommodate rapidly shifting business requests.

Solution

The company embraced VMware virtualization as an enabling technology to drive availability, improve hardware capacity utilization of application servers—then worked with House of Brick Technologies to extend VMware to its Oracle RAC database environment.

- Company on track to 100 percent virtualization, with 300 virtual servers deployed on six physical hosts
- Virtualization to encompass Oracle database tier as well as enterprise applications

Results

- Improved scalability; can add new server in 30 minutes
- High availability protects against risk of losing sales to competitors
- Performance of virtualized Oracle RAC nodes significantly better than on legacy physical servers
- Improved hardware utilization from 10 percent to as much as 80 percent
- More robust DR architecture

Business Agility Becomes Reality at American Tire Distributors

With Help from House of Brick, Oracle E-Business Suite Application and Oracle RAC Now Run Under VMware for Dynamic Scaling of Enterprise Applications

American Tire Distributors (ATD), headquartered in Huntersville, N.C., is the largest replacement tire distributor in the United States.

The company's success is no accident. In fact, ATD is growing at the rate of 10-20 percent annually, partly through aggressive acquisitions, and partly via organic growth, including the expansion of its Tire Pros franchise operation. ATD has also recently launched an Internet-based tire storefront. The site allows consumers to select tires directly from the ATD inventory; when they purchase tires, the sales are channeled through local ATD retail partners for processing and delivery.

ATD couldn't begin to achieve that kind of growth, or any of its business goals, if it didn't have the right IT strategy. “We need to be able to scale in any direction,” notes Tony Vaden, CIO, American Tire Distributors. “Either vertically, by adding CPU or memory, or horizontally, by adding applications or database capacity. And we have to be nimble. We have to be able to scale out quickly.”

Achieving on-demand scalability on a conventional IT platform would be difficult, if not impossible. But ATD has embraced VMware virtualization technology, first within its applications tier, and now—with the help of VMware channel partner House of Brick Technologies—in its Oracle Real Application Clusters (RAC) database tier. And that has proven to be a true agility enabler.

Spinning up New Applications Server in 30 Minutes

ATD first began virtualizing its IT infrastructure within its Windows environment, including its Microsoft Exchange servers and back office applications software.

Next, the company tackled the applications tier of its enterprise resource planning (ERP) application, Oracle E-Business Suite. This initiative included a number of infrastructure refreshes. ATD re-platformed its Oracle software from a mainframe to HP PA-RISC servers. It implemented a tiered architecture for data storage. And it implemented a disaster recovery (DR) strategy under which a duplicate of its server architecture is hosted by an offsite SunGard facility.

Leveraging VMware virtualization technology further increased the value of the ERP modernization effort. Take the DR program, for example. “We use EMC Replication Manager to replicate both our Oracle and our non-Oracle virtual machines to our DR location,” Vaden notes. “If we needed to, we could immediately fail over to that site and run our business under that facility's VMware vSphere environment.”

Virtualizing also enabled ATD to respond more quickly to the company's business needs. “We can scale out on demand,” explains Angelic Gibson, IT Operations Director, American

VMWARE AT WORK

VMware vSphere™ 4.0

- VMware ESX® 4.0

DEPLOYMENT ENVIRONMENT

Primary application

- VMware Virtual Server Infrastructure

Primary hardware

- HP ProLiant BL 460c G blade servers

Primary software

- Oracle E-Business Suite
- Oracle RAC databases
- Microsoft Exchange 2007
 - 1600 mailboxes
- Oracle Real Application Testing software
- Oracle Swingbench

Tire Distributors. “We keep a gold copy of our application tier servers, so that if we need to, we can spin up a new server in less than 30 minutes.”

This is useful because with the kind of business volume ATD transacts, bottlenecks can develop quickly. ATD wholesales its tires through a network of over 85 distribution centers in 37 states, which serve on average around 80,000 customers per day. In a typical transaction, a retailer accesses the ATD e-commerce site through a point-of-sale computer. If retailers run into issues when they try to view the site, they don't wait around. They can't. They have customers waiting for quotes on replacement tires. They need to make the sale and move on to the next customer. They would abandon the ATD site and move on to a competitor's.

To avoid scenarios like that, the ATD infrastructure must be highly available—and VMware virtualization supports high availability in a number of ways. If there's a hardware-level failure, for example, VMware just moves that device's virtual servers to a new physical host. Service to end users isn't interrupted.

What's more, with VMware virtual machines, ATD can add servers to its application suite to accommodate upticks in application usage. This business agility helps ensure ATD is prepared for changes in its transaction volume. “It's critical that our IT architecture has the flexibility to support our business every minute of the day,” notes Vaden.

Virtualizing Oracle Databases to Maximize Agility

Virtualizing its application tier was an important step toward achieving that flexibility. But ATD's goal was to drive similar agility within its database tier. Before it proceeded, however, the company wanted to verify that its Oracle RAC cluster would perform as well under VMware as it would on a physical server infrastructure.

So the company engaged House of Brick Technologies, a VMware channel partner, to help it upgrade its Oracle databases from 10g to 11g.

House of Brick, which has expertise in configuring Oracle deployments under VMware to accommodate the I/O intensive requirements of virtualized databases, also provided design consultation. It recommended that ATD implement its upgraded Oracle RAC nodes under VMware, and on HP ProLiant servers, instead of staying on the more costly PA-RISC platform. It then designed a proof of concept to test whether this architecture would have a negative impact on database performance.

To perform the tests, House of Brick used Oracle's Real Application Testing load test tool to capture 3.5 hours of ATD's peak production load activity: 29 million transactions totaling 1.5 TB of data and representing a broad cross-section of operations.

It then used a proprietary import/export utility to migrate the snapshot onto two environments, one replicating the legacy PA-RISC deployment, and the other a five-node virtualized server deployment running under Linux Red Hat on HP ProLiant servers. The VMware environment was configured with the same amount of memory used to run the nodes under PA-RISC, but with half the number of CPUs.

Using the House of Brick tool allowed the migration to be completed in 36 hours, significantly less time than the estimated 12 days that would have been required if the team had used standard Oracle data migration procedures.

Once the migration was complete, the team replayed the transactions and compared the environments' performance.

The differences were striking. “The performance of the x86 deployment blew the doors off the legacy PA-RISC deployment,” notes Jim Ogborn, VP, Client Services, House of Brick.

Not only that, but the hardware in the virtualized environment never exceeded around 10 or 12 percent utilization; within the traditional server test environment, the hardware—which had twice as many CPUs—needed to run at 70-100 percent utilization to accommodate the same workload.

To push the test even further, House of Brick created a simulated online transaction processing workload using Oracle Swingbench. “We threw everything we could at the virtualized environment, and it chugged right through,” Ogborn says. “When we ran the same load on a physical environment, it crashed.”

The test proved, to ATD’s satisfaction, that virtualizing its Oracle RAC databases was not only feasible, but would improve the performance of its Oracle E-Business Suite database tier. ATD is therefore moving forward on virtualizing this last piece of its infrastructure. “We’re excited by the possibilities,” Gibson says. “Thanks to House of Brick our database servers are now virtualized, so we can make better use of our hardware capacity. We can host less-critical applications on the same physical hardware as our databases if we need to. And just as we can create new applications virtual machines on demand, we’ll be able to create new database servers on the fly. If we lose one RAC node, we can quickly build a new one.”

The flexibility of a VMware virtualized environment also makes it easier to give certain classes of transaction more resources if required. One example is when ATD customers go to a distribution center to pick up tires. One of ATD’s business goals is to generate invoices quickly for these transactions, so that its customers don’t have to wait around for their invoices to print. Processing pick-ups also happens to be a transaction-heavy task, because it includes everything from matching inventory against the order to locating the customer’s account. As a result, in a traditional environment, server performance can slow down. But with VMware, if the servers dedicated to pick-ups become sluggish, ATD can spin up a new database server and introduce it to the cluster, giving pick-up-related applications more resources. “Our goal is to print invoices within 15-30 seconds,” Gibson notes. “With VMware, we have more options for making that happen.”

A virtualized Oracle database infrastructure can also be configured to run on fewer physical servers. As a traditional environment, ATD’s database deployment utilized 10 percent of its hardware capacity. Under VMware, ATD anticipates utilization will be more along the lines of 70-80 percent.

“We consider VMware to be an enabling technology,” Vaden concludes. “From our Exchange servers to our ERP environment, we’ve seen success stories throughout our entire footprint ever since we virtualized our first application.”

