

CASE STUDY

# RED HAT PROVIDES PRICELINE.COM WITH COST-EFFECTIVE, HIGH-PERFORMANCE SOLUTIONS

Priceline.com looks toward the future with virtualization

Priceline.com Incorporated (Nasdaq: PCLN) operates Priceline.com, a leading US online travel service for value-conscious leisure travelers, and Priceline Europe, a leading European online hotel reservation service.

In the US, Priceline.com offers customers more ways to save on their airline tickets, hotel rooms, rental cars, vacation packages, and cruises than any other Internet travel service. In addition to getting the best published prices, leisure travelers can narrow their searches using Priceline.com's TripFilter™ advanced search technology, creating packages that save even more money and take advantage of Priceline.com's famous Name Your Own Price® service, which can deliver the lowest prices available.

Priceline Europe operates one of Europe's fastest growing hotel reservation services through its Booking.com network of hotel reservation services, Activehotels.com, and Priceline.co.uk. Priceline Europe operates in 40 countries in 12 languages and offers its customers in Europe and the US access to approximately 25,000 participating European hotels.

Priceline.com also operates the following travel websites: Travelweb.com, Lowestfare.com, Rental-Cars.com, and BreezeNet.com. Priceline.com has a personal finance service that offers home mortgages, refinancing, and home equity loans through an independent licensee. Priceline.com licenses its

business model to independent licensees, including Priceline mortgage and certain international licensees.

Priceline.com's technology execution has been recognized with multiple awards in the past year. Keynote Systems, an Internet performance metrics measurement company, voted Priceline.com number one for reliability in the field of online travel agencies and number one for speed in the field of online travel agencies. Network World magazine also acknowledged Priceline.com's data center innovation with an award this year.

## FAST FACTS

**Industry:** Travel services

**Geography:** United States

## OPPORTUNITY

Priceline.com regularly sees millions of page views and thousands of bookings per day. As an Internet-based travel service provider, downtime and outages are not an option. The company decided to shift to Red Hat and open source solutions in order to provide the highest-performing services and applications possible and to realize cost savings. Priceline.com also evaluated JBoss due to the company's predisposition toward developing in Java and to potentially generate further savings based on the open source model.

## SOLUTION

Today, Priceline.com has about half of the infrastructure converted over to a mixture of Red Hat Enterprise Linux, Red Hat Network Satellite Server, and JBoss Application Server with Tomcat and Apache web servers.

**Software:** Red Hat Enterprise Linux, Red Hat Network Satellite Server, and JBoss Application Server with Tomcat and Apache web servers.

**Hardware:** Sun V20z servers with AMD Opteron, HP ProLiant DL385 servers with AMD Opteron, and HP ProLiant DL380 with Intel Xeon.

## BENEFITS

The combination of Red Hat and JBoss has been a win-win for Priceline.com. Priceline.com's application availability runs >99.97 percent and hits 100 percent for most quarters. With Red Hat Enterprise Linux, the company has realized reduced security patching requirements than with some proprietary application servers. Through a series of initiatives, like the company's JBoss implementation, Priceline.com IT has been successful in proportionally reducing its relevant domestic operational IT budgets for this type of infrastructure, despite increases in product complexity and product unit volumes. Forward-looking, Xen support and virtualization technologies are extremely attractive to Priceline.com. The company has been testing Xen in its development environments to reduce hardware costs and lower TCO.

## OPPORTUNITY

Ron Rose, CIO at Priceline.com, knows the value of open source and Red Hat. After leaving his position as CTO at Standard and Poor's Retail Markets where he implemented one of the first large-scale

Linux infrastructures in the financial services industry, he arrived at Priceline.com with a plan to implement and deploy Linux once again.

"Even before I came to Priceline.com, I already had a history with Red Hat as a key vendor providing enterprise-level Linux distributions for demanding, real-time, highly available online applications. I was also fully aware of the technical sophistication required from vendors and customers alike in using Linux successfully. After the initial company build was achieved, I knew we would inevitably need to make a change to open source at Priceline.com," said Rose.

Priceline.com regularly sees millions of page views and thousands of bookings per day. As an Internet-based travel service provider, downtime and outages are not an option. Rose knew they needed to shift to Red Hat and open source solutions not only for cost reduction, but to provide the highest-performing services and applications possible.

**"Our success, however, is more than controlling costs. As our industry awards demonstrate, we've been able to attain world-class levels of availability and performance too. Red Hat and JBoss, as a division of Red Hat, have proven themselves to have enterprise-level tools that, when used well, help us attain what all companies want - great availability, great scale, and at a reduced cost when compared to proprietary solutions."**

Initially, there was a large degree of skepticism within Priceline.com IT about whether open source tools could obtain the levels of availability and stability that they required. But, according to

Rose, "It did not take very long for people to realize, once they started using Linux and JBoss, that these are really good tools and are head-to-head competitive with proprietary tools."

Priceline.com also evaluated JBoss due to the company's predisposition toward developing in Java and to enable further cost savings based on the open source model. "We took a look at the leading J2EE application servers and we found the feature set and reliability of the JBoss implementation to be as good as, if not better than, the licensed alternatives," said Rose. "JBoss was also extremely attractive since we would avoid proprietary application server costs."

## SOLUTION

Today, Priceline.com has about half of its worldwide server infrastructure using such tools as Red Hat Enterprise Linux, Red Hat Network Satellite Server, and JBoss Application Server with Tomcat and Apache web servers. Much of the hardcore plumbing underneath the product lines has been ported over and "works very well," said Rose.

Priceline.com is best known for its Name Your Own Price business model, but over the last several years has complimented this offering with a more traditional retail sales model. Some of the company's retail implementations are done almost entirely utilizing Red Hat Enterprise Linux and JBoss. The implementations are a typical 3-tier MVC pattern using STRUTS, Apache http server, Tomcat, JBoss, and Oracle databases.

Priceline.com found Red Hat and JBoss training a great resource. Many Priceline.com Linux system administrators utilized Red Hat training, and several engineers received their certification. In particular, the company found JBoss on-site training indispensable during their application server roll-out.

"In support of our initial JBoss application server deployment, we engaged JBoss Professional Services in training our staff. We continue to rely on JBoss support so we can get access to the engineers who know the code the best -- the authors. This is an area where JBoss excels," said Rose. "JBoss is fostering the growth of an open source ecosystem by compensating the authors of quality open source offerings. It is great to be able to have access to these talented developers."

## BENEFITS

The combination of Red Hat and JBoss has been a win-win for Priceline.com. Priceline.com's application availability runs >99.97 percent and hits 100 percent for quarters at a time, according to Rose.

With Red Hat Enterprise Linux, the company has realized less security patching requirements than with some proprietary application servers. Priceline.com also found semi-automated patching success with Red Hat, which allowed them to maintain a high velocity of application changes without having patching challenges get in the way. From a Linux and JBoss support perspective, Priceline.com benefited significantly from having a single vendor manage and help drive quicker resolutions of support issues.

"Our total cost of ownership (TCO) story clearly shows lower manpower requirements by using Red Hat Enterprise Linux from a support, patching, and management standpoint," said Rose. "The added benefit of the Red Hat and JBoss

combination eliminates what we at Priceline.com call 'the index digit syndrome' – where two vendors point fingers at each other when engaged in debugging exercises. It is great to have one vendor for our support and this enables faster resolutions to issues."

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Forward-looking, Xen support and virtualization technologies are extremely attractive to Priceline.com. The company has been testing Xen in its development environments to reduce hardware costs and lower TCO.

"With the release of Xen support in Red Hat Enterprise Linux 5, we see more validation for virtualization technologies by another major software supplier," said Rose. "Virtualization will have a dramatic TCO advantage next year as we begin to mainstream this technology with our application servers. As a result of virtualization technology implementation, we estimate that we can reduce box counts and enhance recurring TCO up to 33 percent in the corporate portion of our infrastructure. In addition, virtualization should help us

enhance the power of our development/QA infrastructure thus increasing the speed of product development. Virtualization has already started helping us eliminate server TCO and complexity and we see it continuing to do that effectively."

Overall, Rose has found Red Hat's acquisition of JBoss a favorable development for Priceline.com and the industry as a whole.

Rose noted, "Integration and configuration complexity and variability is often what I consider to be one of the most challenging things about open source. Although, we've seen relatively few issues at Priceline.com because we are a relatively skilled shop, we do know that people have had issues with configuration complexity for open source in the past. Anything that helps simplify the configurations and get to reliable, scalable software configurations is a true benefit for the industry."

"Working with Red Hat and JBoss as a single company helps lower our costs and increases our uptime by providing a complete software stack, from the operating system through the application layer. It reduces the time required for troubleshooting, configuration complexity, and contracts and vendor management," said Rose. "We consider Red Hat and JBoss both to have great products that we respect. Now that they are combined, we can't wait to benefit from their future cooperative developments."

