

# Global Hotel Chain's Web Site Finds "Suite" Spot

New Architecture Helps Largest Hotel Brand Boost Web Performance by More Than 100%

## Abstract

The Web is a highly competitive channel for leading hotel chains. The same holds true for our client, whose primary revenue stream flows from its 24x7 Web booking reservation system. Yet in July 2006, the self-service tool was stressed beyond its limits. It was experiencing daily outages and duplicate bookings. Keane recommended the client migrate the application to a new architecture to improve the system's performance, reliability, and availability. However, the decision to go forward with the plan was not an easy one. The company had planned a \$1 million Web personalization project with a launch date just seven months away. How could it implement two sizeable IT projects before the next peak travel season? And how could Keane ensure the seamless integration of the two projects?

Keane laid out an extensive risk mitigation plan and partnered with the client to implement all aspects of the system overhaul. The reservation system's new architecture was a true

success, cutting response rates in half and boosting performance by more than 100% — outranking rival chains such as Starwood and Hyatt.

## Business Challenge

With over 4,000 hotels across the globe, our client is the world's largest hotel brand. The chain has historically harnessed the power of technology to bring convenience to its guests: In 1995, it first listed its hotels online and by 2000 the company introduced Web booking to its guests all over the world.

Web booking systems are a highly competitive channel, requiring hotel chains to continually provide better and faster service in order to attract and maintain customers.

But our client's leading edge in the online arena was faltering. The Web booking system was being stressed beyond its limits. July is the highest revenue-generating month in the travel industry and during the summer of 2006 the system could neither support the

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onslaught of bookings nor meet performance targets.

Moreover, the system was experiencing daily system outages and duplicate bookings. With such highly visible system defects, our client knew that more was at stake than loss of critical revenue; its very reputation was at risk.

Keane has been providing application maintenance and development services to the hotel chain since February 2005. Yet, by the summer of 2006, the Keane support team was engaged on a daily basis to resolve system outages, frequently applying patches to keep the system running. Keane found that the problem was at the aging system's core: It was built to process transactions sequentially, essentially queuing up users' transactions and increasing the wait time for those at the end of the queue, or worse, causing some transactions to time out altogether. The single-threading in the code, however, was not the only problem. Inefficient transaction management was causing bookings to be duplicated, which was directly related to revenue loss.

The application had peaked at its vertical and horizontal scaling capabilities, meaning that the old design had reached its limits and that merely adding more servers would not improve performance. The application was already running on 46 blades, far too many, Keane estimated, for an average daily volume of 2 million Web users.

## Solution

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To address these core limitations, Keane recommended the hotel company migrate the application to an n-tier clustered architecture, which would improve non-functional aspects such as performance, reliability, availability, scalability, extensibility, and security. Although the migration would mean rewriting 70% of the code, the new system would support clustering, parallel transaction processing, and caching, allowing multiple transactions to be processed simultaneously and significantly improving the response time for users.

Our client clearly saw the need to migrate to a new architecture; however, the decision to go forward was not a simple one. The company had already engaged Keane to implement a \$1 million Web personalization project with a launch date of March 2007— just seven months away. Adding personalized features to its Web booking system, such as single sign-on access to multiple areas of the Web site, was key to helping the hotel chain regain competitive ground. This presented a seemingly insurmountable challenge: Even if our client could find the budget to implement two sizeable IT projects simultaneously, how could it pull them off before the start of the peak travel season? And how could Keane ensure the seamless integration of the two projects?

With both the migration and the personalization teams working on the same code baseline, there were many risks. The two teams collaborated and proposed a solution that would ensure

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both projects would be completed in time for start of the 2007 summer travel season. Keane laid out an extensive risk mitigation plan and configuration management strategy that ensured that the two teams could work on parallel branches of the same code at the same time and provided a contingency plan that protected one project if the second incurred delays.

Keane partnered with the hotel chain's IT organization to implement all aspects of the system overhaul: selecting and installing hardware and software, building the application architecture, setting up infrastructure, clustering servers, ensuring system failover, developing the deployment strategy, and performing all phases of development from design and coding to testing and implementation.

## Results

The new architecture was a true success, improving performance by more than 100%. In the eyes of our client, success was confirmed by its ratings on Gomez.com, an Internet performance monitoring service. Gomez is the third-party source the hospitality industry relies on to rank the performance, availability, and consistency of travel-related Web sites. the hotel chain's ranking before the Web booking project launch was typically 13th or 14th, with an average response time of 13 seconds. After the migration, it registered in 4th place, cutting its response rate in half to 6.5 seconds.

With a new architecture, our client has found its "suite" spot, outranking rival chains Starwood and Hyatt and travel sites Priceline, Travelocity, and Hotels.com.

What's more, Keane's migration project boosted system availability to over 99.9%. Previously, a one- to two-hour outage was required each time our client needed to update or repair the system. The hotel chain could now make software updates without shutting down the system. In addition, the migration engagement met all provisions of the SLA, releasing the new system on time, on budget and with a defect density of less than .001% per lines of code. The migration project produced other significant improvements that boosted performance and lowered the cost and effort to maintain the system, including:

- » Improving search functionality by 500%, reducing the range of response time from 10-25 seconds to 2-4
- » Eliminating duplicate bookings issue. The system now experiences duplicate bookings
- » Reducing lines of code from 500K to 100K
- » Reducing server instances from 106 to 50
- » Reducing hardware from 46 to 26 physical blades, saving costs associated with space and maintenance
- » Reducing Internet backbone bandwidth from 50 to 25 terabytes

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- » Consolidating data and lessening application's dependence on external systems
- » Increasing security by moving application code from the Internet zone to a secure zone

With the migration project completed, the personalization project proceeded as scheduled and was delivered successfully, providing the hotel chain with a better user experience for its customers.

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#### About Keane

Keane is an IT services firm headquartered in the US with more than 12,000 professionals worldwide. For 45 years, Keane has been an Application Services specialist with distinguished project management credentials. Today, we offer a flagship suite of Application Services, as well as Infrastructure and Business Process Outsourcing solutions delivered through onsite, nearshore, and offshore resources. Visit [www.keane.com](http://www.keane.com) to learn how our projects, managed services, and outsourcing engagements deliver value for a range of businesses and government agencies.

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