Transworld Data Case Study

Marriott Focuses on Customer Experience and Expands Business Channels

With over 3,500 lodging properties in the U.S. and 69 other countries and territories, revenue of nearly 12 billion dollars for 2010 and a daily workload of over 750,000 new reservations, Marriott is one of the largest hospitality companies in the world. The demands on its hotel reservation system are enormous. Transaction throughput must be rapid and unfailing, 24/7, from anywhere. If problems arise, failover must be swift and absolute. The customer experience and business intelligence systems must be able to "right fit" pricing and accommodations for customers, because they are integral to achieving and maintaining competitive advantage. So, too, is the ability to extend the "reach" of Marriott's reservation community from the company-hosted Website and systems to the Websites and systems of worldwide channel partners that sell Marriott reservations along with other services.

"One of our goals is to increase the number of distribution channels for our inventory," said Misha Kravchenko, Vice President, Global Enterprise Mainframe Systems for Marriott International. "As the Internet continues to take off, there are more and more niche players such as travel agencies that do the bookings. This is the "long tail" of our distribution network, and we want to be a part of this."

Marriott also has other business goals for its inventory of accommodations. It wants to optimize the customer experience with Marriott. This means not only instantaneous order fulfillment at any time and from any point, but also best pricing for any given location, coupled with the ability for Marriott Rewards customers to capitalize on the special qualities of that relationship. It also wants to optimize occupancy rates for its accommodations.

As part of the effort, Marriott processes an average of 1,500 transactions per second, offering multi-lingual capability to customers in both single-byte format and the double-byte format that is used for Asian languages that employ ideographic characters. Ninety-nine percent of all transactions take less than one second, regardless of where you are in the world. "Many of these transactions come in through Internet threads that are parallel-processed," said Kravchenko. "We've seen an eighteen percent jump in Internet shopping over the past year, and we expect that trend to continue."

Here's how the parallel processing works:

At the time that the customer is shopping, the customer reservation transaction is simultaneously run on zEnterprise with business intelligence software that looks at member status, inventory status and dynamic pricing models. Factors considered include whether the customer is staying over on a Wednesday night or through a weekend, and whether the customer is a Marriott Rewards Platinum member. On the room inventory side, systems also consider whether rooms in the area the customer is requesting lodging for are in an under- or over-sold status. All of this system intelligence comes together in a "best price, best yield" scenario for both Marriott and the customer in less than one second. "The goal is to book inventory down to the last room available to maximize yield," said Kravchenko. We can expeditiously do this from a centralized reservations system, no matter where in the world the reservation is requested."

Getting From Point A to Point B with IT

Creating the technology to handle multiple market objectives can be challenging, but Marriott found that it could continue to leverage existing IT resources while acquiring and making conversions to others. To achieve the positioning in the market place that it wanted, Marriott felt that it needed to accomplish several things:

- Ensure that its mainframe system could and would continue to meet the growing demands of its worldwide customer base, while maximizing the yield on its accommodations inventory;
- Provide a friendly and pleasant online experience to its customers that also rewards customers for their loyalty;
- Capitalize on a growing number of Internet-based and other business partners that were interested in reselling Marriott products along with their own offerings, in turn expanding the reach of Marriott's products;
- Operate in a real-time, fail-proof, 24/7 environment where the sun never sets on someone's ability to make a reservation, regardless of where they are in the world;
- Perform the entire process cost-effectively.

IBM zEnterprise: The Heart of the System

Marriott has a heterogeneous data center that begins with an IBM zEnterprise System and an IBM System z10 mainframe at its primary processing center and a System z10 mainframe backup system at its remote disaster recovery site. Additionally, Marriott's IT infrastructure includes a mix of small and midrange systems that host the full range of Windows, Linux and Unix operating systems. "All of these systems are in-sourced, which we consider to be a competitive advantage," said Kravchenko. "We also run virtualized resources, and are in the process of evaluating the addition of zBX."

A major priority is meeting the demands of a global customer base. “Our zEnterprise system uses a TPF operating system that we have optimized over the years for our reservations processing, and that we believe is a strategic competitive advantage,” said Kravchenko. “In addition to TPF, we run z/VM with virtualized zLinux systems on this machine.” Marriott installed its first zEnterprise machine in December of 2010, but has already seen the advantages of the new platform. “Transaction processing is over 40 percent faster, which really benefits our worldwide customers,” said Kravchenko. “We’ve also seen our cost per MIP drop considerably, so that we didn’t need to spend more. We have seen absolutely no cost increases for the Linux IFLs that we run on zEnterprise, yet we’ve seen a 40 percent increase in our capacity. The overall improvement that we’ve experienced with zEnterprise is very noticeable.”

While Marriott runs its OLTP (online transaction processing system) that supports reservations on zEnterprise, it also runs its Marriott Rewards frequent guest database, revenue management, and certain internal systems like Payroll on a System z10 running z/OS in its primary data center in Maryland, and it has its second System z10 in an underground disaster recovery facility in Pennsylvania. Marriott runs Microsoft Exchange and additional mathematically intense applications on distributed Unix and Linux servers. “We use different platforms for different computing functions, and we connect mainframe resources with them by using sophisticated messaging and communications techniques including MQ,” said Kravchenko. “What has really helped us with overall data center cost reductions in communications is a move from SNA proprietary communications to TCP/IP.”

Using IT to Deliver Strategic Business Value

A major Marriott goal is to extend the reach of its hospitality products over Internet-channels so that consumers are able to buy wherever they are and from whatever Website they happen to be visiting. “In order to do this, we have to be able to scale our systems for greater numbers of channel business partners, and we also need to be able to add these partners quickly,” said Kravchenko.

The goal is to make it simple and inexpensive for channel partners to connect with Marriott’s central systems.“In the past, this process was labor-intensive and high cost, because we had to effect these connections serially, with each business partner,” said Kravchenko. “We were able to drastically reduce both the costs and the timeframes for on-boarding new channel partners by migrating to an SOA (service-oriented architecture) paradigm for software and converting our application transactions into open XML (extensible markup language) components. This allows for the actual translation of in-coming channel partner transactions, which is performed in real time on IBM DataPower appliances.” Kravchenko noted that the change to an SOA-based solution wasn’t easy. “It required an upfront investment in software that ported legacy application code to XML, but we also had to go through the process of parsing the original application code and then moving it to the XML format. This required intense testing, but the resulting code is fully reusable and has in fact become a key leverage point for helping us to continue to

reduce our costs in the future. We also can now expedite adding new channel partners because we are no longer working with bilateral interfaces."

At the same time, Marriott moved its business intelligence (BI) logic from distributed systems to the zEnterprise mainframe and also added XML support to the mainframe for SOA transactions. The move facilitated "smarter" transaction processing for customers and enhanced the customer experience by linking business intelligence with a request for a room. This gives a customer the best value if he is a valued Marriot Rewards club member, and it also concurrently checks available rooms inventory in the geographical location requested to see if rooms are in either an overbooked or undersold status (one of the determinants for pricing). "Using this dynamic pricing mechanism to address our inventory and our customer reservations in any part of the world at any time is extremely important for us, and the mainframe is a critical enabler of it," said Kravchenko. "Because of mainframe processing and built-in redundancy, we can achieve this combination of transaction processing and business intelligence globally without the risk of a system outage, and we can continue to run, even during those times when we are executing data reorganizations. This is significant, because as we grow, we are adding new hotels. When this happens, it is simply a matter of a effecting a real-time configuration change or an update on the mainframe, and is entirely transparent to our customers who are making reservations."

A third element for Marriott is 24/7 availability, high reliability of systems and the ability to failover transparently if needed. "We replicate our System z10-resident DB2 database over to our disaster recovery site in Pennsylvania," said Kravchenko. "For example, we use a variety of in-house developed utilities, and vendor-supplied software products to optimize our Disaster Recovery capabilities. These were instrumental in assisting us with managing a huge and very complex database. It has not only helped us with cost reductions because the database was more efficient and it took less IT staff to support it, but it positioned us for the kind of rapid failover we wanted to achieve in our DR strategy." Marriott got the results that it was after: a recovery point objective (RPO) time of less than one minute, and an overall recovery time objective (RTO) of under fifteen minutes.

Concluding Remarks

Marriott is continuing to expand its product offerings throughout the world, which also means continuing to add hotels, channel partners and brands on a worldwide scale. It backs this business expansion with agile, highly reliable computing constructed around rapid and intelligent transaction processing. "We plan to continue to add computing capacity as we need it, but meanwhile, we are seeing enormous efficiencies and performance gains from zEnterprise with its new compilers, and we are also leveraging the 64-bit architecture," said Kravchenko. "As a global company, we have to have a 24/7 operation that not only positions us for growth, but also for the delivery of richer functionality. To be able to continue to scale out our supply chain of business channels, zEnterprise is a viable platform to do this on, especially when combined with vendor-

supplied software and hardware that enhance the mainframe value proposition for our business."