RED HAT HELPS MEDQUIST STREAMLINE CLINICAL DOCUMENTATION WORKFLOW WITH JBOSS AND RED HAT ENTERPRISE LINUX

FAST FACTS

Company	MedQuist Inc.
Industry	Clinical Documentation Workflow Solutions
Geography	Mount Laurel, New Jersey
Business Challenge	Enabling a rapidly growing, high-volume, 24x7 business, through the creation of an agile and highly productive development environment for building and running mission-critical applications.
Software	JBoss Enterprise Application Platform, Red Hat Enterprise Linux
Hardware	x86 servers
Migration Path	From many database centric Windows platform components towards a SOA enterprise architecture providing service orchestration, platform independence and loose coupling of coarse-grained application modules. The latter allows for an evolutionary approach to re-platforming of a very large enterprise system without a large up-front cost and significant business risk.
Benefits	A highly productive, flexible and robust application development environment that enables MedQuist to proficiently produce innovative functionality for customer-facing solutions and to quickly take advantage of newly acquired applications by efficiently integrating them into its DocQment Enterprise Platform.

BACKGROUND

MedQuist Inc. is a leading provider of medical transcription software and related services. By delivering solutions that automate document creation and workflow to hospitals, doctors, and other healthcare providers, MedQuist helps its customers efficiently manage large volumes of complex clinical information.

The company has two separate but connected sources of revenues. First, it offers comprehensive software solutions that include digital voice capture, speech recognition, electronic signature, medical coding systems and services, and mobile dictation devices. It currently sells these solutions to more than 1,500 healthcare organizations throughout the United States. Secondly, MedQuist employs more than 4,000 skilled medical transcriptionists who process approximately 2 billion lines of text annually. The company employs more than 7,500 employees and earned $327 million in revenues in fiscal 2008.

BUSINESS CHALLENGE

Because of rapid growth since the early 2000s, MedQuist was looking for innovative ways to keep pace with ever-increasing system demands.

"We process more than 100,000 distinct dictated medical reports and notes per day," said Kirk Elder, director of software engineering for MedQuist. "Our systems have to categorize them, classify them and route them through our workflow processes – from the time we receive the digital recordings until the final report is delivered to the customer."

MedQuist currently has 10 clusters of speech recognition servers with each cluster containing 30+ servers, for a total of more than 300 servers to perform the all-important task of converting voice recordings to text-based documents. The voice recordings and related text files are than sent to medical transcriptionists (MTs) to correct and edit. After the MT finishes transcribing the report, the MedQuist

platform sends the report to physicians to electronically sign the documents. Those documents are then routed back to the hospitals or clinics to printers, automated systems and/or their electronic health record (EHR) system, depending on whether the customer requires the information to be in paper or electronic form.

Before 2007, most of the MedQuist software used for this complex workflow routing was developed using various proprietary technologies, including C++ among others, making it more and more challenging to quickly respond to new market requirements and opportunities. Because MedQuist was quickly growing through acquisition, it also became difficult to efficiently incorporate the systems of newly acquired companies into the MedQuist DocQment Enterprise Platform.

"We are in the process of moving to an n-tiered SOA architecture based on Java middleware. With the JBoss Enterprise Application Platform, we are positioned with the tool set to evolve our product suite towards SOA, without the upfront costs of re-writing everything at the same," said Brian Ellenberger, development manager at MedQuist.

SOLUTION

Due to the economics of re-platforming a system this large, MedQuist has taken an evolutionary approach to moving its application platform to a JBoss-based environment. In fact, Elder's group chose JBoss in 2002-2003 when their division was a separate company. At the time, there were two reasons for doing this: price and performance.

- "As JBoss is an open source, it was much less costly than proprietary application server options," said Elder. "JBoss was a bargain compared to proprietary application servers."
- There were technical advantages to platform itself. "JBoss seemed to be a very good platform for our developers, as the open architecture gave us lots of options. It was high performing, too, and easy to understand," continued Elder.

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> – Dan Garnett,
> Vice President of Product Development,
> MedQuist.

When his company was acquired by MedQuist, the IT team at the parent company evaluated what Elder's team had done using JBoss, and was so pleased with the results that it decided to make JBoss the platform for developing new software modules.

"We have 20 to 50 software modules that run on hundreds of servers that must all work in concert with each other," said Kirk. "Previously, because of all the acquisitions, there was not development standards for making sure everything worked together."

Today, the JBoss Application Server is embedded in the developer platform that Elder's team releases to all MedQuist's software engineering teams each quarter. "So everyone is developing software in a standard way with standard third-party libraries," said Ellenberger. "Because we do development all over the world, this keeps us in sync and helps us maintain efficiency, while simultaneously reducing our overall development costs."

Today, in addition to the JBoss Application Server itself, MedQuist uses Hibernate. Although just starting to use JBoss Seam for reporting, it is considering basing all future thin-client development platforms on Seam.

Underpinning all this, in mid-2007, MedQuist moved from a Microsoft Windows-based infrastructure to one based on Red Hat Enterprise Linux.

"When we were looking to upgrade our enterprise database operating system to a more scalable, reliable, and cost-effective solution than windows, Linux was the obvious choice. We looked at which company would be a partner and help ensure our success. Red hat proved it then and every day since," said John McKenna, Director of Software Engineering.

BENEFITS

The fact that JBoss is built using open standards has been a major boon for MedQuist. Indeed, its JBoss implementation has been so successful that MedQuist made an enterprise-wide decision to eliminate its dependence on vendor-specific solutions.

"We like the fact that JBoss is so open," said Elder. "With the JBoss micro kernel architecture, we can even replace JBoss modules with other modules without any trouble. This allows us to avoid the vendor lock in we had experienced before."

How critical are JBoss Enterprise Application Platform and Red Hat Enterprise Linux to MedQuist's business?

"Our applications are mission critical and absolutely need to be available 24x7. Red Hat products like JBoss and Red Hat Enterprise Linux just work enabling us to focus on building industry-leading software, which in turn helps our customers reduce their costs and improve patient care," said Dan Garnett, Vice President of Product Development, MedQuist.

The open nature of the JBoss platform has delivered other benefits as well. For example, in the case of JBoss, "His team "can debug all the way through the code, and work around and fix even the most complex development issues by utilizing the source code," said Elder. "JBoss also integrates well into our build process. We've been very successful at creating build scripts that get standard JBoss environments up and running for new developers or projects very quickly and painlessly."

Finally, Red Hat as a company has proven to be solid and reliable. "Over time, we've developed a solid relationship with Red Hat and JBoss, and anticipate that our partnership will only get better over time," said Elder.

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