

JBoss Enterprise Middleware AND HIGH AVAILABILITY

PROTECTING YOUR BUSINESS AGAINST UNPLANNED DOWNTIME

Whether affecting customer-facing applications such as online banking or retailing, or internal applications that employees depend on to perform their jobs, system failures can take a huge toll on the financial health, productivity, and market reputation of businesses. Recognizing this, many organizations are designing their systems using a high-availability architecture to maximize the uptime of key applications and platforms.

This whitepaper outlines how customers are using JBoss Enterprise Middleware today to support mission-critical applications, reducing both application management costs and user inconvenience due to unplanned downtime.

CONSIDERATIONS WHEN CHOOSING MIDDLEWARE FOR HIGHLY-AVAILABLE APPLICATIONS

Choosing the right middleware infrastructure is a critical part of implementing high-availability architectures. You should make sure your middleware solution:

- **Includes clustering as a standard component.** Some commercial application servers only offer support for high availability and clustering in their more costly “premium” versions. With JBoss Enterprise Middleware, because of its focus on mission-critical deployments, clustering is a core feature of each of its platforms.
- **Automatically enables failover and recovery.** Automatic recovery ensures that users and processes are not negatively impacted during a system failure.
- **Is proven and robust.** Since high availability is a critical component to any mission-critical enterprise application, it is important that the technology that supports this feature is widely deployed across numerous mission-critical environments in different industries.

JBoss Enterprise Middleware meets all these criteria and more. Because all JBoss Enterprise Middleware products are written to Java standards and are 100 percent open source, any Java developer has complete transparency into how clustering has been implemented.

Mature open source projects and technologies such as JBoss Application Server, JBoss Cache, JBoss Transactions, JGroups, and mod_cluster have been developed with complete transparency, tested by thousands of developers, and used in many different products over many years. Red Hat bundles clustering from these projects and technologies with standard versions of JBoss Enterprise Middleware, eliminating the extra cost businesses would incur if using a proprietary application server.

AUTOTRADER.CO.UK USE CASE

JBoss Enterprise Application Platform Helps Support 10 Million Monthly Unique Visitors and 100 Million Searches via a Highly-Available Platform

AutoTrader.co.uk is the United Kingdom’s No. 1 motor-ing website, with more than 10.3 million monthly unique users who perform more than 106 million searches on new and used vehicles every month. AutoTrader.co.uk is owned by Trader Media Group, one of Europe’s largest specialist multimedia groups.

Trade Media Group had been using a variety of platforms to support more than 100 key applications on the AutoTrader website. But this heterogeneous mix of disparate technologies was costly, inefficient, and raised challenges related to effective knowledge management across the organization. Additionally, high availability was key to AutoTrader maintaining its leadership in the market, as its users needed to rely on a high-performing website that was accessible 24 hours per day, seven days per week. The firm recognized it needed to replace these legacy platforms and standardize on a single middleware stack to streamline maintenance and support, as well as leverage the time of operations personnel more effectively.

Trader Media Group evaluated a number of solutions, both proprietary and open source, that could offer the availability it required while supporting Enterprise JavaBeans (EJB) and the Hibernate application



framework at the enterprise level. Trade Media Group selected JBoss Enterprise Application Platform as it offers high availability by integrating a clustered Java EE application server with JBoss Hibernate.

By standardizing on JBoss Enterprise Application Platform running on Red Hat Enterprise Linux, the AutoTrader website now has a robust, high-performing, and highly-available platform from a single vendor that spans the operating system and middleware layers.

"We are more than happy with JBoss Enterprise Application Platform running on Red Hat Enterprise Linux," said Peter Nanlon, chief technical architect, Trader Media Group. "Our 60-strong development team is happy with the implementation and the operation teams understand it, laying strong foundations for the future."

THE BUSINESS CASE FOR HIGH AVAILABILITY

Transparent failover and recovery capabilities are critical for both customer-facing and internal systems.

From a customer's perspective, high availability improves the user experience by isolating external users from downtime and systems failures. Thus, high availability translates directly into higher revenues and higher quality service.

In addition to frustration, users have security concerns when a system crashes while they are in the process of entering sensitive, personally identifiable information (PII) such as social security or credit card numbers. There is often anxiety over where the "lost" data ended up. Was it saved somewhere that is not adequately secure? Is it accessible by unauthorized persons?

With the high availability features of JBoss Enterprise Middleware, businesses can avoid this scenario by designing a system that automatically moves processing to another server should one server fail, thus ensuring data integrity and a seamless experience for the customer.

High availability is also critical for internal applications. Unplanned downtime is the bane of IT shops, as it results in disgruntled users, lost organizational productivity, and high operational costs. A high-availability architecture minimizes downtime and eliminates the need to manually

diagnose and restart systems, translating directly into lower costs and more efficient use of IT personnel's time.

COVAD USE CASE

JBoss Enterprise Application Platform Enables 99.99 Percent Uptime of Broadband and VoIP Services to 57 Million Homes and Businesses

Covad Communications is a leading provider of integrated voice and data communications. As a broadband specialist and pioneer, Covad was the first vendor to commercially deploy DSL in the United States. It owns the largest broadband network in the country, and is the only provider of data, voice, and wireless telecommunications solutions for small- and medium-sized businesses (SMBs) with a nationwide DSL footprint. A major supplier of broadband access for companies like Earthlink, AOL, and AT&T, Covad offers its services to more than 57 million homes and businesses to 235 major markets in 44 states.

Covad once used proprietary middleware running on proprietary hardware to manage the complex billing and operational support systems (BSS/OSS) that support Covad's broadband wholesale and retail customers. Covad developed a broad range of front-end applications using this proprietary software that integrated with its BSS/OSS applications and were accessible to sales and support representatives via the Internet. These applications were also part of a modular service-oriented architecture (SOA) Covad built in 2003 to enable rapid deployment of new applications.

But Covad increasingly found the licensing terms of the proprietary software inflexible, inhibiting its ability to add new functionality to its existing systems, develop new ones, and scale to meet market demands. "If you wanted to do something as basic as use the middleware on a different network, you had to completely renegotiate the license," said Unmesh Kulkarni, technology leader of the software and information systems (SWIS) department within Covad, which is responsible for automation of all sales and support operations for the Covad network services. "This inflexibility was really hampering our ability to innovate, which is a cornerstone of our company.



Additionally, the proprietary systems—both the hardware and the software—were prohibitively expensive. “We were spending millions of dollars on these proprietary solutions, and knew we could find a cheaper alternative,” said Kulkarni.

But, as important as cutting costs were, Covad couldn't afford to compromise on availability, as its middleware platform supported a broad range of mission-critical applications that had to be available 24/7.

For example, it had built a “prequalification engine” that sales representatives use to determine which Covad services were available to a potential customer at a particular location. “You have to go through a lot of data to come up with an answer quickly,” said Kulkarni. “Our applications often have less than two seconds to respond, otherwise the customer won't wait, and we lose the sale.” Because Covad gets literally millions of these requests every day from hundreds of partners, “this was an absolutely mission-critical system, and our middleware needed to be robust enough to handle it,” he said.

Today, Covad has 400 x86 and SPARC machines running JBoss Enterprise Application Platform, and 32 CPUs running JBoss Operations Network, an integrated management platform that simplifies the development, testing, deployment, and monitoring of JBoss Enterprise Middleware.

The cost savings have been substantial. Covad was spending \$800,000 a year on hardware and software for the proprietary middleware. Today, it pays \$200,000 annually, plus \$70,000 per year for support—a savings of \$500,000 annually.

Even more significant, Covad recognized vastly-improved availability. Moving from the proprietary platform to JBoss Enterprise Middleware was part of an overall corporate mandate to run lean software operations, without sacrificing the quality of customer service.

“We had to offer our customers 99.99 percent availability, and our developers still had to roll out new software every eight weeks. That's why we love JBoss Enterprise Middleware. It allows us to do more with less,” said Kulkarni.

JBoss Enterprise Middleware also enabled Covad to reduce the time-to-market of new services. Covad's software division recently designed and deployed a new JBoss-based voice over IP (VoIP) solution within four months. “We moved from concept to product within this extraordinarily tight time frame, something we could never have done with our proprietary middleware,” said Kulkarni. “And instead of costing us millions, the cost was minimal.”

HIGH AVAILABILITY FEATURES OF JBOSS ENTERPRISE MIDDLEWARE

With JBoss Enterprise Middleware's modular design and stack-based approach to clustering, everything is provided out-of-the-box, with no additional layered software or add-ons needed. Among other advantages, this results in a lower total cost of ownership (TCO) for the application. Among other features, JBoss Enterprise Middleware offers:

- **Full session replication.** This ensures that a user's session will not be interrupted if a server goes down or otherwise becomes unavailable. Online customer portals are increasingly using this feature when implementing electronic shopping cart or product quoting functionality. Without it, the contents of a potential sale are lost if the system supporting the session crashes. But with the full session replication functionality bundled with JBoss Enterprise Middleware, the session is maintained on at least one other server so that the session can be redirected without disrupting the user experience.
- **Messaging failover.** As a matter of course, many applications route requests to other systems using a message broker. This common system needs to be highly available to avoid losing critical messages and to prevent messages from being delivered multiple times. With JBoss Enterprise Middleware, if the messaging infrastructure breaks for any reason, messages will be routed through the system in other ways to ensure that messages are not lost, and that messages are not sent more than once. JBoss Enterprise Middleware enables seamless messaging failover as a built-in feature to its core application server.



- **Transaction integrity.** High availability also helps to maintain the integrity of critical transactions in the face of any number of failure scenarios. For example, when transferring funds from one account to another, financial institutions require the transaction to be completed (for funds to be debited from one account and credited to another) even if a database goes offline or if a network is disconnected in the middle of the process. JBoss Enterprise Middleware's clustering capabilities support transaction integrity for even the most mission-critical systems.

MEDQUIST USE CASE

JBoss Enterprise Middleware Supports 10 Clusters of 30+ Servers to Achieve High Availability of 24x7 Medical Processing Application

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.

Because of its rapid growth, 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 that span 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. Each cluster contains 30-plus 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 then 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 electronic health record (EHR) systems.

Before 2007, most of the MedQuist software used for this complex workflow routing was developed using proprietary technologies, making it challenging to quickly respond to new market requirements and opportunities. JBoss Enterprise Middleware was the obvious solution. There were clear cost savings and high-availability benefits. "JBoss Enterprise Middleware is much less costly than proprietary application server options," said Elder. In addition, the solution needed to be highly available. "Our applications are mission critical and absolutely need to be available 24x7," said Dan Garnett, vice president of product development, MedQuist. "JBoss Enterprise Middleware 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."

JBoss Enterprise Middleware: Designed for High Availability

JBoss Enterprise Middleware provides a proven foundation for mission-critical applications that require superior performance and scalability. Its high-availability services provide the clustering, caching, failover, load balancing, and distributed deployment features expected in a best-of-breed platform. By offering high availability as a standard component in every enterprise platform, JBoss Enterprise Middleware helps today's businesses ensure business continuity by optimizing system uptime while minimizing costs.

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