

## Migrating to JBoss

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## Agenda

- Company Overview
- Project Synopsis
- Drivers
- Decision Making Process
- Testing Methodology & Results
- JBoss in Production
- Benefits
- Best Practices
- Resources

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## Company Overview

La Quinta  
Inns · Inn & Suites

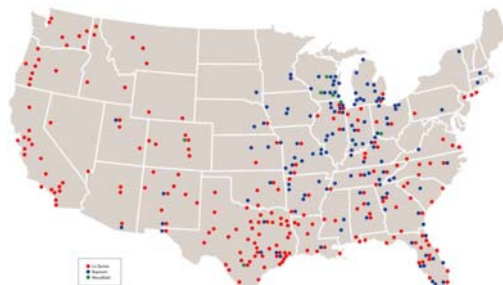


- Limited Service Hotels ("Mid-Scale Market")
- 3 Brands
- 590+ Hotels in 39 States, 2 in Canada
- Corporate and Franchise Properties
- Publicly Traded Company (NYSE: LQI)
- Based in Dallas, Texas

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## US Coverage Map

La Quinta  
Inns · Inn & Suites



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## Brand Websites



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## Partner Websites



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## Project History

- Re-launched online presence in Summer 2002
- Deployed middle tier on WebLogic, driven by consulting partner
- Introduced to JBoss in early 2002 by our WebLogic Clustering consultant
- Attended JBoss Advanced Training in January 2003
- Migration decision in Summer 2003
- JBoss migration completed in March 2004



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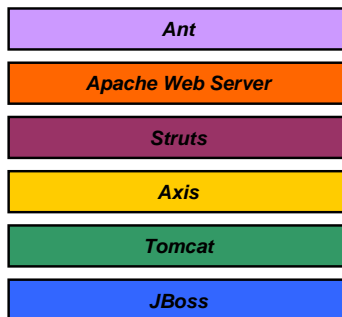
## Project Summary

- La Quinta ported existing Java/J2EE objects running on BEA WebLogic 6.1 SP2 to JBoss Application Server 3.2.3. The total project took two developers a total of eight man weeks to complete.
- Six week project duration - one developer
- Final two weeks - additional resource for server configuration and deployment process



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## Our Open Source Stack



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## Use of Application Server

- Transaction engine for availability, rate, cancel, modify, and booking messages between websites and central reservation system
- Primary purpose is message translation
- Powers our brand websites
- Partner website connectivity via web services



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## Project Drivers

- Business
  - ✓ Eliminate future software license and increased support costs
- Technical
  - ✓ Selection of "best of breed" technology offering
  - ✓ Open Source preference



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## Decision Making Process

- Performance is everything
- No downtime
- Limited impact to feature development
- Do we have time to dedicate to this right now? - time vs. money

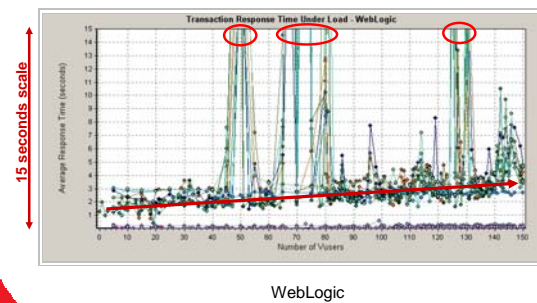


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## Testing Methodology

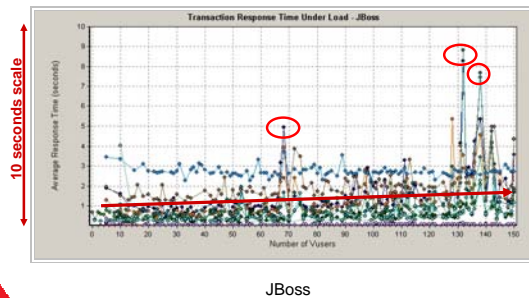
- Side by side load testing using Mercury LoadRunner
- Eliminate as many variances as possible
- Identical Hardware, OS, JVM
- Minimal code changes
- Identify specific differences between WebLogic and JBoss
- Did not include latest version of WebLogic as additional test

## Transaction Response Time



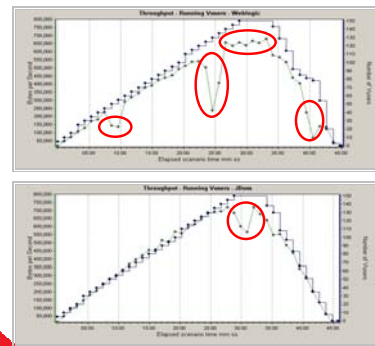
WebLogic

## Transaction Response Time

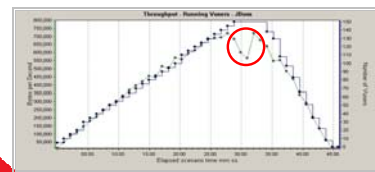


JBoss

## Throughput

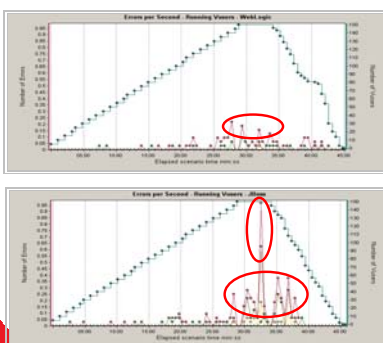


WebLogic

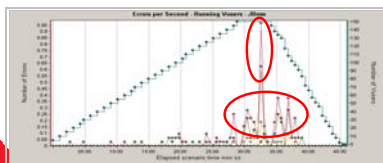


JBoss

## Errors Per Second



WebLogic



JBoss

## Huh?!

- Transaction Response Time
  - ✓ JBoss
- Throughput
  - ✓ JBoss
- Errors Per Second
  - ✓ WebLogic
- "JBoss, the faster, higher throughput, more error prone application server" (???)

## Testing Results

- Performance improvement from JBoss - not expected
- Greatest improvement was in transaction response time
- Improved response times exposed problem in backend system, initially assumed the problem was with JBoss
- Greater errors per second from JBoss was due to increased performance!



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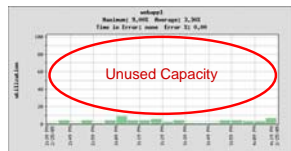
## JBoss in Production

- Launched JBoss on a weekend (early March 2004)
- The Monday after launch was the best day ever (to date) for online business
- Points to direct benefits of application server efficiencies under heavy load



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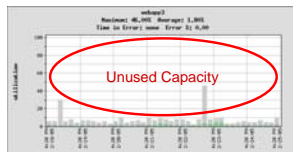
## JBoss Production CPU Utilization



February 2005 Data

Servers:  
Solaris 8 for Intel  
Dual 1.2GHz SPARC III  
2GB RAM

Goodbye,  
Middle Tier?



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## Benefits - Expected

- Elimination of future software license and increased support costs
- A support model based per application, not on deployment size
- Comfort from knowing technical support comes from actual developers
- Tomcat covered under the JBoss support agreement



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## Benefits - Unexpected

- Improved performance
- Reduction in long-term hardware costs via improved server utilization
- Improved customer satisfaction from performance enhancements
- "More business"



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## Best Practices

- Clearly Identified Purpose(s)
  - ✓ Insure that the team has identified a purpose or set of purposes for the project
  - ✓ Why are we considering a migration to JBoss?
  - ✓ Is there a business reason to make a change?
  - ✓ Cost savings vs. performance



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## Best Practices

- Criteria for Acceptance
  - ✓ Develop a set of criteria for project acceptance
  - ✓ "To move JBoss into production, we must..."
  - ✓ What are the criteria after launch to determine if the project was a success?



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## Best Practices

- Approach (Resources)
  - ✓ Determine the project approach, relating to resources
  - ✓ Internal or External Effort?
  - ✓ Onsite or Offsite?
  - ✓ Offshore?



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## Best Practices

- Timing
  - ✓ Rely upon your business cycle to set the project roll-out
  - ✓ When is the best time to implement an infrastructure change? Retail vs. Travel Cycle
  - ✓ Support renewal or capacity purchase timing considerations
  - ✓ Fiscal year



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## Best Practices

- QA Process
  - ✓ Establish a QA process to analyze your test results
  - ✓ Side by side testing data - eliminate variables
  - ✓ Identical environments
  - ✓ Minimize code changes for migration testing
  - ✓ Application Server vs. Application Server



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## Best Practices

- Support
  - ✓ Provide a support structure for your production system
  - ✓ External and internal
  - ✓ Who are your experts?
  - ✓ What is the escalation path?



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## Best Practices

- Directory Structures
  - ✓ Version Specific:
    - /usr/local/bean/wlserver6.1/
    - jboss-4.0.1sp1-src/
  - ✓ Generalized:
    - /app/jboss/



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## Best Practices

- URLs
  - ✓ Avoid port-based, vendor-specific URLs in your application code
  - ✓ Apache proxy over port 80 using mod\_jk and mod\_proxy
  - ✓ ...or set your application server port to 80 (if it is acting as the web server)



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## Best Practices

- JVM Memory Tuning
  - ✓ JBoss uses default JVM settings
  - ✓ NOT tuned for production
  - ✓ #1 problem with JBoss performance
  - ✓ Edit run.bat / run.sh
  - ✓ `JAVA_OPTS="$JAVA_OPTS -Xss128k -Xms1024m -Xmx1024m -XX:+DisableExplicitGC"` (an example)
  - ✓ Disable calls to `System.gc()`



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## Best Practices

- Log Files
  - ✓ Automated log file processes
  - ✓ Directory and file permissions
  - ✓ Analysis scripts - expected syntax



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## Best Practices

- GUI to Conf File Transition
  - ✓ Apache-style configuration
  - ✓ WebLogic-style GUI configuration



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## Best Practices

- Application Server Specific Changes
  - ✓ Integration Code
  - ✓ Clustering
  - ✓ Build Scripts
  - ✓ Startup Scripts
  - ✓ 3rd Party Libraries
  - ✓ Configuration Files
  - ✓ Deployment Descriptors



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## Resources

- La Quinta Case Study
  - ✓ <http://www.jboss.com/company/customers>
  - ✓ Customer link from the JBoss website
- Migrating to JBoss Webinar
  - ✓ [http://www.jboss.com/services/online\\_education](http://www.jboss.com/services/online_education)
  - ✓ Webinar link from the JBoss website



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## Contact

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**Thank you!**



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