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Discount Tire: Migrating from WebLogic to JBoss

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06.27.12

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DISCOUNT[®] TIRE

- America's Largest Independent Tire Retailer
- Over 50 Years in business, 14,000 employees
- Mixture of Linux, Windows & AS400
- Red Hat Partner over 8 years

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Daily Statistics – **Tires.Com**

- Over 500,000 sessions daily
- An average of almost 3 million pages served daily
- 15% traffic growth projected over 12 months
- Small Administrative staff to manage sites
- Small programming staff to build enhancements

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DISCOUNT
TIRE
AMERICA'S
TIRE



America's Largest Independent
Tire Dealer - Since 1960

Home | Tires | Wheels | Store Locator | Easy Credit | Info Center | How to Buy | Cart is Empty

Vehicle 2012 > MERCEDES BENZ > E550 CABRIOLET > 207 CHASIS 18"BASE w/TPMS



Makes

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Falken Wheels

Konig

Mandrus

MB Wheels

Petrol

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Purchase Details

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DR-37

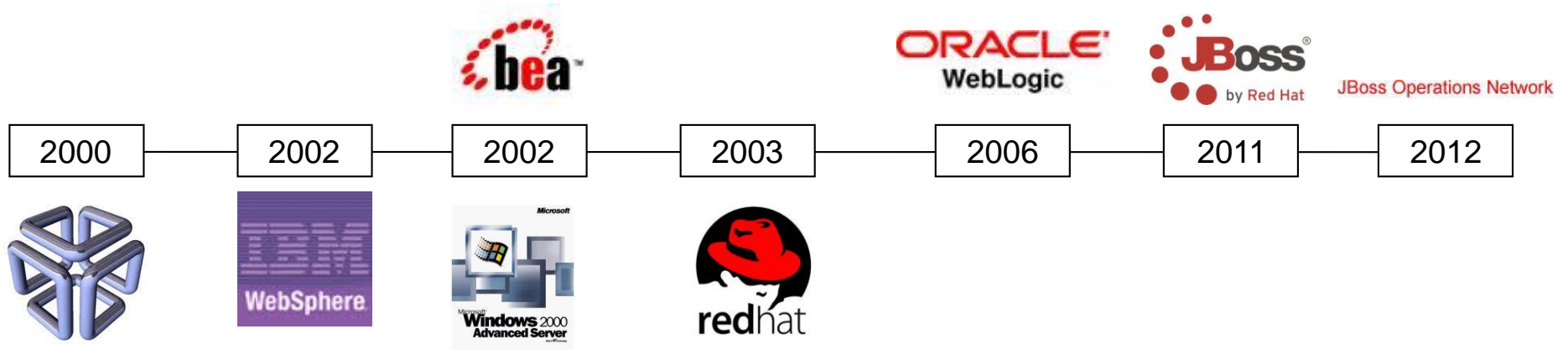
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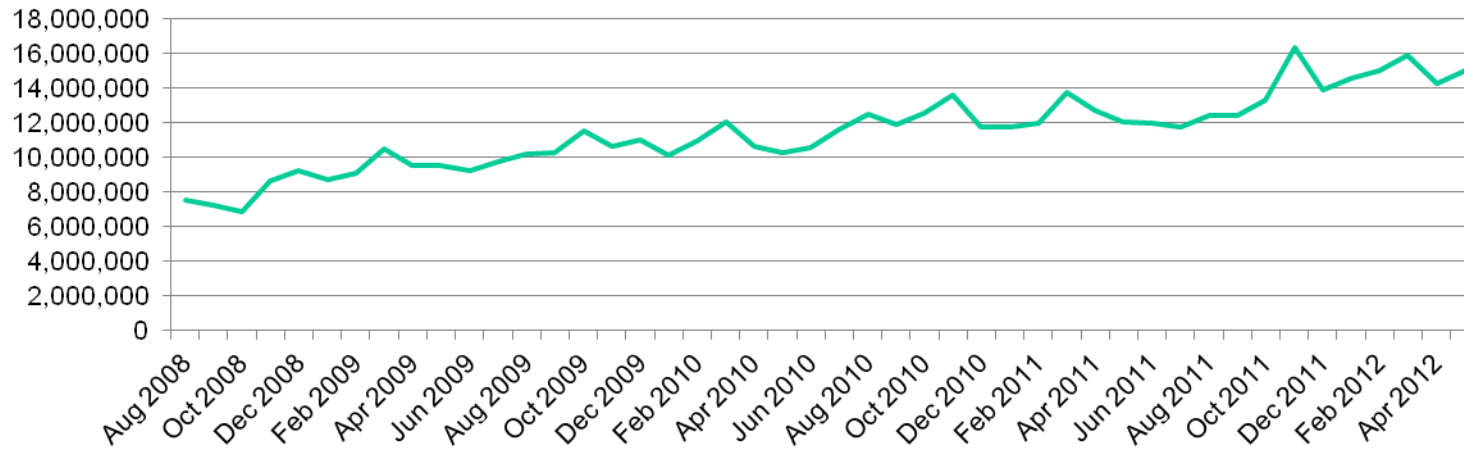
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Tires.Com Evolution



Visitors



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Our Experience with Oracle WebLogic

- Traffic overwhelming the infrastructure
 - Traffic increase caused daily issues
 - 32-bit Java limited heap size
 - Licensing limited CPU
- Support was unable to resolve open issues
 - Difficult and time consuming to submit and work support tickets
 - Support staff unable to determine cause of complex issues
- Pricing – made it expensive to scale out



Why JBoss?

- Longstanding Vendor Relationship
 - Involved sales and technical resources
 - Excellent support
 - Capable and available professional services
 - http://www.redhat.com/f/pdf/jboss/JBoss_WeblogicMigrationGuide.pdf
- Pricing
 - 48% reduction in the five-year application cost
 - Allows us to scale out and up for less
- Most Excellent Yearly Conference (Summit)



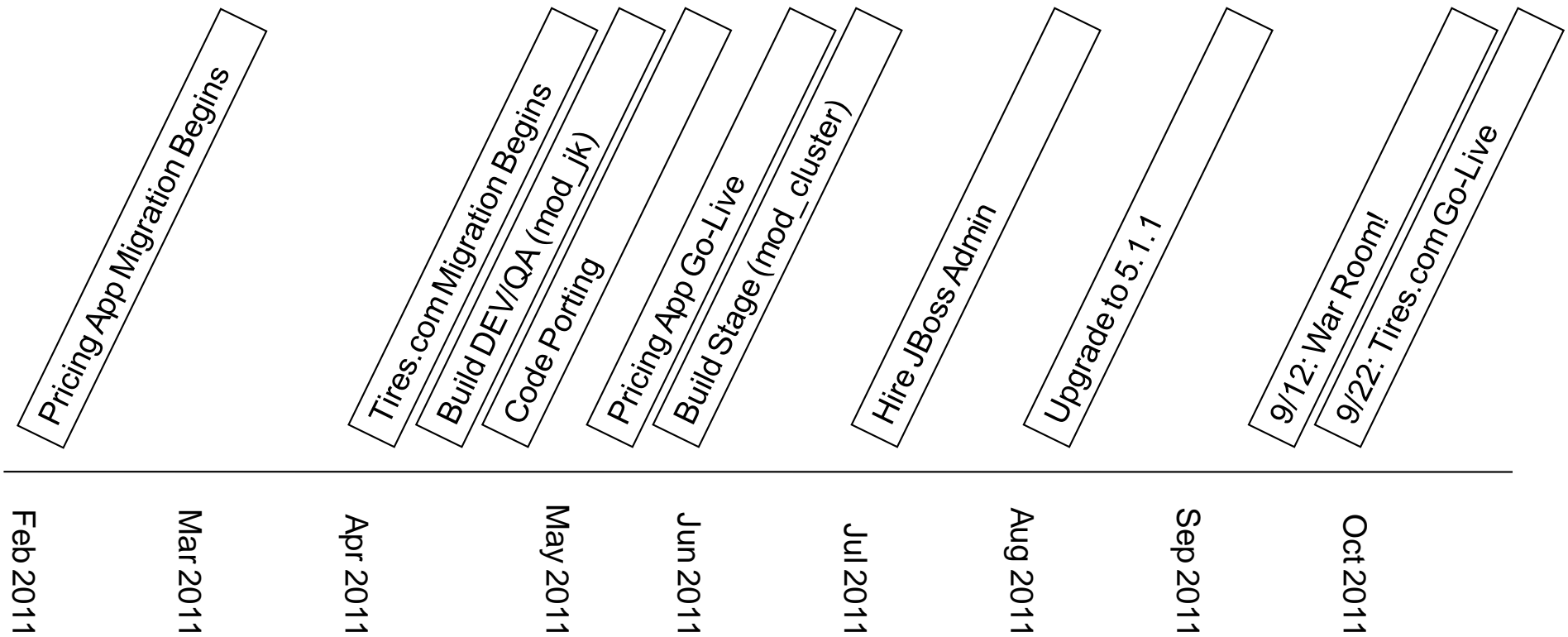
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Migration Timeline – WebLogic to JBoss



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Application Migration

Getting Our App to Run in JBoss

- JBoss Configuration
 - Set up jTDS for SQL connectivity
 - Create –ds.xml files
 - Place jTDS JAR in \$configdir/lib
 - Change JMS from HSQLDB to MSSQL
 - Replace \$configdir/deploy/messaging/hsqldb-persistence-service.xml
 - http://docs.redhat.com/docs/en-US/JBoss_Enterprise_Application_Platform/5/html/Getting_Started_Guide/configuring_jbossmessaging_persistence_manager.html



Application Migration

Getting Our App to Run in JBoss

- Application Migration
 - POM migration
 - No option to pre-compile JSPs at time of deployment. Had to move JSP pre-compile to Ant:
<https://issues.jboss.org/browse/JBAS-3002>
 - Remove Weblogic-specific libraries
 - Migrate weblogic.xml
 - <https://community.jboss.org/wiki/PortingFromWeblogic>
 - Enterprise Java Beans
 - Migrated weblogic-ejb-jar.xml to jboss.xml
 - Set ejb-jar.xml to user EJB 2.1



Application Migration

Getting Our App to Run in JBoss

- Application Migration
 - Class Loader Errors
 - Strategies
 - A single copy of JAR at the EAR level when JAR needed by both the EAR and at least one embedded WAR
 - A copy of the JAR within the WAR when the EAR did not require the library
 - Remove JAR files provided by JBoss or Java
 - Deleted or renamed classes in source code
 - Workaround
 - Change the class loader behavior to search parent first
 - See “ClassLoader Strategy” in http://www.redhat.com/f/pdf/jboss/JBoss_WeblogicMigrationGuide.pdf



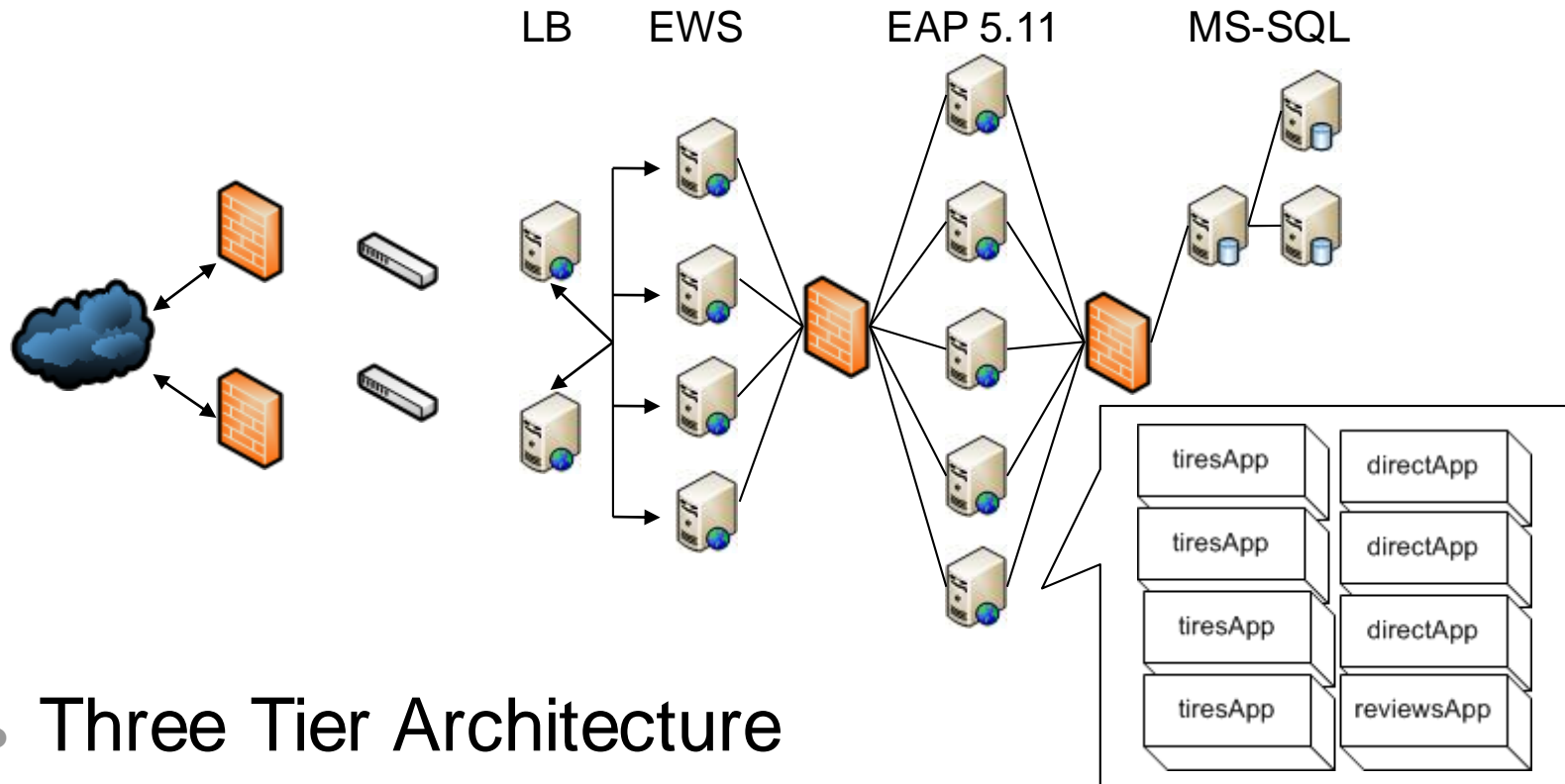
Application Migration

Getting Our App to Run in JBoss

- Application Migration
 - Login Logic
 - Added application policy to \$configdir/conf/login-config.xml and configured to pull from database
 - Add <security-domain>java:/jaas/TiresAdminAuthentication</security-domain> to jboss-web.xml
 - http://docs.jboss.org/jbosssecurity/docs/6.0/security_guide/html/Encrypting_Data_Source_Passwords.html
 - Java Server Faces from 1.0.1 to 1.2



Tires.Com - Architecture



- Three Tier Architecture
- Apache (JBoss EWS) and Mod_Cluster v.1.1
- JBoss EAP 5.1.1 and Sun Java 1.6.0

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Tires.com – Web Server

- JBoss Enterprise Web Server

- Apache 2.2.17
- Installed from RPM through Red Hat Satellite channel
- Worker MPM
- Sizing parameters from: <http://lbconfig.appspot.com>

- Connector Configuration – mod_cluster

- http://docs.redhat.com/docs/en-US/JBoss_Enterprise_Web_Server/1.0/html/HTTP_Connectors_Load_Balancing_Guide/ch06s02.html#

```
LoadModule slotmem_module modules/mod_slotmem.so
LoadModule manager_module modules/mod_manager.so
LoadModule proxy_cluster_module modules/mod_proxy_cluster.so
LoadModule advertise_module modules/mod_advertise.so
```

```
Listen 10.10.10.10:10001
<VirtualHost 10.10.10.10:10001>
```

```
    ManagerBalancerName name
```

- Site Configuration

- Discount Tire standard configuration delivered through Red Hat Satellite
- Sites created as named virtual hosts
- Connection to EAP cluster:
 - ProxyPass /context balancer://name/context
 - ProxyPassReverse /context balancer://name/context

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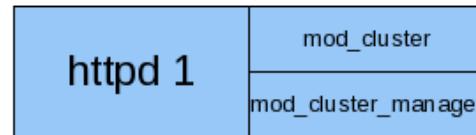
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Tires.com – HA Clustering

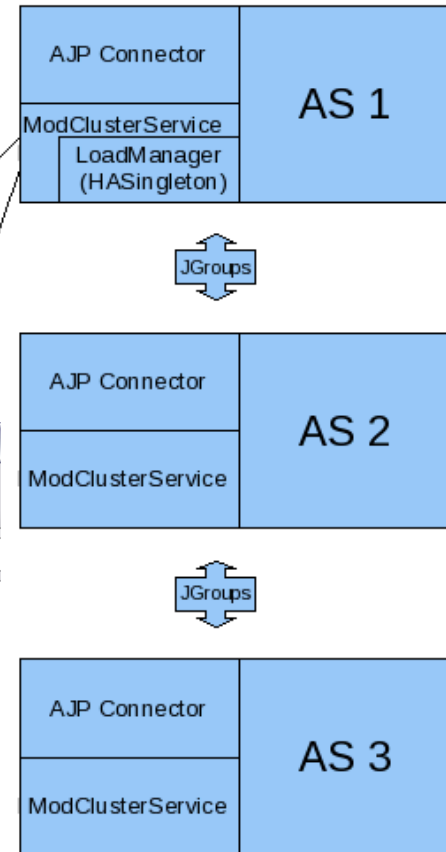
- EAP nodes form cluster and elect Singleton
- Singleton updates proxy(ies) on node status and load
- Discount Tire uses a static proxy configuration:

```
jboss.modcluster.proxyList=10.10.10.10:10001,10.10.10.11:10001
```



A screenshot of a Mozilla Firefox browser window. The address bar shows the URL: `http://10.0.176.18...Cmd=INFO&Range=ALL`. The page content displays a list of 16 nodes with their respective details:

```
Node: [1], Name: dtc104, Balancer: dtc, Host: 10.10.10.110, Port: 8409, Type: ajp, Connected: 2, Load: 75
Node: [2], Name: dtc301, Balancer: dtc, Host: 10.10.10.112, Port: 8109, Type: ajp, Connected: 0, Load: 88
Node: [3], Name: dtc108, Balancer: dtc, Host: 10.10.10.110, Port: 8809, Type: ajp, Connected: 0, Load: 76
Node: [4], Name: dtc101, Balancer: dtc, Host: 10.10.10.110, Port: 8109, Type: ajp, Connected: 1, Load: 76
Node: [5], Name: dtc302, Balancer: dtc, Host: 10.10.10.112, Port: 8209, Type: ajp, Connected: 3, Load: 93
Node: [6], Name: dtc102, Balancer: dtc, Host: 10.10.10.110, Port: 8209, Type: ajp, Connected: 0, Load: 81
Node: [7], Name: dtc304, Balancer: dtc, Host: 10.10.10.112, Port: 8409, Type: ajp, Connected: 0, Load: 77
Node: [8], Name: dtc107, Balancer: dtc, Host: 10.10.10.110, Port: 8709, Type: ajp, Connected: 2, Load: 89
Node: [9], Name: dtc305, Balancer: dtc, Host: 10.10.10.112, Port: 8509, Type: ajp, Connected: 1, Load: 77
Node: [10], Name: dtc105, Balancer: dtc, Host: 10.10.10.110, Port: 8509, Type: ajp, Connected: 1, Load: 82
Node: [11], Name: dtc307, Balancer: dtc, Host: 10.10.10.112, Port: 8709, Type: ajp, Connected: 2, Load: 77
Node: [12], Name: dtc106, Balancer: dtc, Host: 10.10.10.110, Port: 8609, Type: ajp, Connected: 0, Load: 76
Node: [13], Name: dtc306, Balancer: dtc, Host: 10.10.10.112, Port: 8609, Type: ajp, Connected: 3, Load: 72
Node: [14], Name: dtc303, Balancer: dtc, Host: 10.10.10.112, Port: 8309, Type: ajp, Connected: 2, Load: 74
Node: [15], Name: dtc308, Balancer: dtc, Host: 10.10.10.112, Port: 8809, Type: ajp, Connected: 0, Load: 79
Node: [16], Name: dtc103, Balancer: dtc, Host: 10.10.10.110, Port: 8309, Type: ajp, Connected: 0, Load: 72
```



Tires.com – Application Server

- JBoss Enterprise Application Platform
 - JBoss EAP 5.1.1 installed from zip file
 - Each physical server runs 10 EAP instances
- JVM Provisioning Script
 - Custom script creates each instance using configuration profile
 - Script process: Unzip → Create Home → Slim → Create runtime config file → Configure JMX Console Ports → Configure Databases → Configure Messaging → Install mod_cluster
 - <https://access.redhat.com/knowledge/techbriefs/jboss-eap-slimming-guide>
- Session replication details
 - Buddy replication with 2 buddies
 - <http://docs.jboss.org/jbosscache/1.4.0/TreeCache/en/html/replication.html>
 - Unique service port binding: `-Djboss.service.binding.set=ports-01`
 - Mod_cluster configured with a static proxy list



Tires.com – Application Server - Tuning

- Followed recommendations from EAP5 Performance Tuning guide
 - http://www.redhat.com/f/pdf/JB_JEAP5_PerformanceTuning_wp_web.pdf
 - OS tuning - Send and receive buffers
 - OS tuning - Huge pages
 - Datasource pooling – Min/Max Values, transaction isolation, timeout
 - Thread Pooling – HTTP, AJP, JCA,
 - Logging – Turn down logging levels in Production
 - Apache sizing parameters from: <http://lbconfig.appspot.com>
- For details, attend session “Accelerate Your Enterprise Middleware”, in Room 210 on Thursday at 3:40

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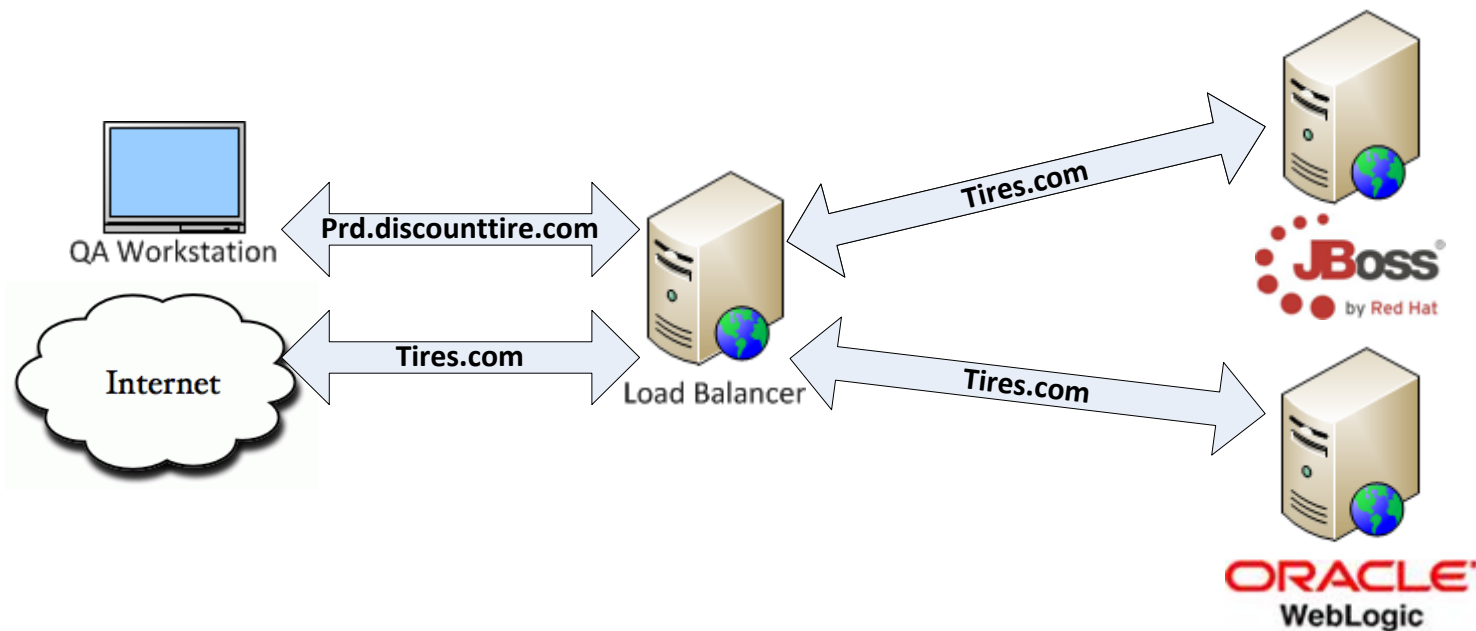
Monitoring

- JON (JBoss On Network)
 - Heap and garbage collection
 - JMS queues
- HP Sitescope
 - JVM Ports (up/down status)
 - CPU, Memory, Disk, Load Average
- HP Real User Monitor
 - Monitors real time site traffic
- HP Business Process Monitor
 - Synthetic Scripts
- Tealeaf CX
 - Capture and storage of customer interactions on sites



Go-Live Testing and Methodology

- Created separate infrastructure for JBoss alongside legacy infrastructure



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Application Deployment - Our Strategy

Automated rolling deployment using Ant

```
Buildfile: F:\apache-ant-1.8\apache-ant-1.8.2\bin\STAGING\jbossdeploydtd\build.xml
jboss-prompt-password:
Jboss Remote Password:
jvm-deploy1:
```

Checkpoint process shows each JVM's status

```
[sshexec] No. of jvms running: 9 - shutting down if any jvms are up
[sshexec] dtd201 shutting down
[sshexec] Shutdown message has been posted to the server.
[sshexec]
[sshexec] Server shutdown may take a while - check logfiles for completion
[sshexec] dtd202 shutting down
```

Script allows interaction to suspend and fix errors

```
progress_check:
  [input] press any key to proceed
```

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Closing Points

- Total Time to transition: 9 months
- Number of headcount: 10
- Application Cost savings: 48% reduction in 5 year cost
- Capacity increases:
 - Discounttire.com: CPU --- 50%, Memory --- 32%
 - Discounttiredirect.com: CPU --- 67%, Memory --- 55 %
- Performance increase:
 - Discounttire.com: 39.6% faster page load time
 - Discounttiredirect.com: 39.7% faster page load time
- Significant increase in uptime, huge decrease in alerts



Migration Approaches/Support Available?

- 1) Learn more about other success stories in migration to JBoss, WebLogic/WebSphere to JBoss Migration Guides, get Evals and More @ the getunstuck microsite : <http://www.redhat.com/jboss/getunstuck/>
- 2) From Community to JBoss Subscription, some Guides available at <http://docs.redhat.com> and Programs may be available from your Red Hat Sales Team.
- 3) Engage Red Hat Consulting

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Background

- » Amentra, founded in 2000, acquired by Red Hat in Early 2008
- » Extensive implementation experience across technology platforms and industries
- » Industry Recognized by Gartner, Forrester, CIO Magazine

Engagement Models

- » Turnkey Outsourcing / Full Life Cycle Implementations
- » Mentoring-based Solutions
- » Assessment and Recommendations

Service Offerings

- » Systems Development
- » Full Service SOA
- » Business Process Management (BPM)
- » Portal/CMS Design and Development
- » Enterprise Data Solutions
- » Open Source Solutions
- » Platform Migrations

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- » Systems Development
 - Extensive experience in Java and .NET development
 - Recognized for Legacy Modernization approach with integrated mentoring
- » Full Service SOA
 - Real world SOA and integration experience
- » Business Process Management (BPM)
 - Work in both pre-technical business process analysis and technical implementations
- » Enterprise Data
 - Services around Data Warehousing, Business Intelligence, MDM
 - Strategy and Implementation focused with diverse platform experience
- » Open Source Solutions
 - Implementation expertise beyond Red Hat suite of products and frameworks

» Integrated Product & Project Focused Services

- Red Hat can provide a holistic solutions-focused approach by bringing to bear product-focused experts and project-focused implementation resources that work in concert with product development and support teams.

» Mentoring Model

- Red Hat Consulting's mentoring model has been recognized by Gartner and CIO Magazine as an innovative approach to modernizing skill sets and technology platforms in unison.

» Diverse Technology Background

- Red Hat Consulting continues to maintain technically focused knowledge of many enterprise software products. This diverse technical background furthers the solutions-focused approach to services.

» Single Source Provider

- Red Hat Consulting rounds out the already robust open source product and services offering that Red Hat provides through its Linux and JBoss Middleware platforms.

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Red Hat Consulting's ability to implement end-to-end solutions is best demonstrated through the stories of some of our clients.



- » GEICO has been an ongoing client since 2001.
- » Amentra modernized GEICO's legacy mainframe policy management system.
- » In doing so, Amentra enabled GEICO.com and created the 15 minute quote.
- » Most recently, Red Hat consulting moved GEICO from WebSphere to JBoss



- » Red Hat consulting is currently defining the future state reference architecture for the Federal Reserve Bank of Dallas that will be implemented across the regional Federal Reserve Banks around the country.
- » The architecture definition is focusing on development platforms, infrastructure, data strategy, architecture and integration strategy, and staff development.



- » Defined future-state reference architecture and migration plan to move off of PowerBuilder.
- » Designed enterprise integration model across stores and corporate.
- » Focus on entire solution, ranging from architecture definition to development process redesign.

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