Cost of Ownership Analysis

Oracle WebLogic Server[®] Costs versus JBoss[®] Application Server

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A CRIMSON CONSULTING GROUP BUSINESS WHITE PAPER

This study was sponsored by Oracle but was designed and executed by Crimson Consulting Group as an independent, analytical evaluation with research participants screened to include comparable experience with deployments of both Oracle WebLogic Server and RedHat JBoss application servers.

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Executive Summary

In the long-running debate about the relative merits of commercial software versus opensource software, one of the advantages cited for open source has always been that "it's free." In an economy still recovering from recession, where many companies maintain tight budgetary controls on their IT departments, this can sound like a compelling argument. However, the notion that if both the code and its maintenance are free, then the entire application must be free is as simplistic as it is legalistically accurate. In point of fact, the cost of the actual commercial software license in an enterprise deployment can be as little as 5 percent of the total cost of ownership over 5 years – in other words, not a whole lot more than the zero-percent cost of a similar open source application. Decision-makers and executives will be well-served to understand all the components of the 5-year comparison between commercial applications and open-source applications, as well as other potential consequences of pursuing the so-called "low-cost" open source path.

Crimson Consulting Group conducted primary research to investigate a specific example of this cost dynamic: a comparison of the 5-year total cost of ownership ("TCO") between Oracle WebLogic Server® and the JBoss® open source application server from Red Hat.

JBoss costs more than WebLogic Server after 2 years and as much as **35% more** over 5 years.

If the software license is free, then how can the highlighted statement be true? The answer to this reasonable question lies in two areas:

- 1. Commercial software, in this case Oracle WebLogic Server, enjoys significant easeof-use and productivity advantages over JBoss, enabled by a robust array of available tools for configuration, administration, and management.
- 2. These ease-of-use and productivity advantages translate to savings in both the time and the cost of the people required to implement, administrate, and operate the commercial system resulting in the above-referenced 35 percent savings versus performing the same activities with JBoss.

In fact, in a typical installation, the cost advantage that JBoss enjoys by offering free software is cut in half by the time the application goes live for the first time, cut in half again by the end of the first year after purchase, and completely eliminated before the 18-months-from-purchase mark. From that point onwards, WebLogic Server is less expensive on a TCO basis – an advantage that grows every year, based on its 50 percent per year operating cost advantage.



Key Takeaways

- JBoss is 35% more costly than WebLogic Server over 5 years, despite its free license.
- Oracle WebLogic Server becomes less expensive on a TCO basis within two years from acquisition – an advantage that continues to grow with every year of operation.
- Software licensing is a small portion of the total cost of ownership; people costs in operations drive the bulk of longterm costs.
- Other issues, such as performance, time-to-value, and customized infrastructure, can have a significant impact on the overall business ROI of an application server deployment.



Figure 1 illustrates how small the initial costs of Acquisition and Implementation are with respect to the total 5-year costs of an application server deployment. The savings created by not paying for a software license are more than offset by having to invest in employees and consultants for implementation, development of custom scripts and utilities, configuring and testing other open source components, and managing and monitoring the JBoss environment.

It's also worth noting – though not analyzed explicitly in the cost models developed for this white paper – that higher people costs have an impact on schedules as well as on budgets. In every activity associated with implementing, deploying and operating an application server, JBoss requires more time from people with a greater level of skill than are required for the comparable WebLogic Server activities. In today's fast-paced business world, a delay in time-to-value of a mission-critical application, or greater downtime created by maintenance for custom scripts, can have profoundly negative consequences.

The remainder of this white paper summarizes Crimson's sources and methodology in obtaining these results, and looks in detail at the three major areas of application lifecycle costs – Acquisition, Implementation, and Operations – to consider the differences in each between JBoss and Oracle WebLogic Server.



Introduction

As the global economy continues its so-called "recovery," open source application server software such as JBoss can be tempting to some organizations. Its attractiveness is primarily due to the ease of obtaining the software, less restrictive licensing terms, and the fact that there are typically no upfront license fees.

However, organizations should be aware when evaluating investments in application server software that license costs become a small portion of the total cost of ownership over a 3-5 year horizon. The people costs associated with application server configuration, customization, and on-going administration and management are by far the largest cost elements in a long-term deployment.

With Oracle WebLogic Server, customers pay a license fee for software that delivers high performance and mature automation capabilities that have been rigorously tested. Hence, developers, administrators, and operators are more efficient using highly-productive tools. With JBoss, customers can easily and inexpensively acquire the application server software and pay a moderate fee for subscription support, but they spend substantially more time and effort in implementation, infrastructure customization, and ongoing operational administration, and management.

In nearly all cases, JBoss deployments result in one or more levels of customization, including:

- 1. Development of custom toolkits for configuration, administration, and management;
- 2. One-off integrations with infrastructure and other open source components;
- 3. Customization of the server source code

This kind of deployment model requires more time from more highly-skilled people, and differs in cost and work-time required from a deployment of commercial software like WebLogic Server. Such levels of customization have obvious downstream implications on the time and effort required to perform maintenance, updates, and upgrades – and non-obvious implications on uptime, performance, and reliability.



A 5-Year Cost of Ownership Comparison

Crimson's approach to cost of ownership studies highlights the major areas of cost, particularly in those areas where there are substantive differences between JBoss and WebLogic Server. Based on numerous studies in this area, Crimson used a proven framework that includes key cost categories over the lifecycle of a deployment. These categories are listed and described in Table 1.

Category	Description
Acquisition	This category includes the hard costs for purchase of the application server software and for the hardware platform(s) to run it.
Implementation	This category includes the labor costs for implementation, installation, configuration, and testing of the application servers and the related infrastructure.
Ongoing Application Deployment & Testing Costs	This category includes the ongoing labor costs for deploying custom applications from test and staging environments to production environments. It also includes the ongoing interoperability testing and periodic testing for new releases and updates to the application servers and other infrastructure components.
Ongoing Vendor Support Costs	This category includes the hard costs for annual subscription support or maintenance agreements for the application server software, as well as for any additional software required.
Ongoing Administration & Management Costs	This category includes the ongoing labor costs to configure, manage, and maintain the application servers and the related infrastructure.
Ongoing Monitoring, Diagnostics, & Tuning Costs	This category includes the ongoing labor costs to monitor, tune, and optimize the application servers.
Other Cost Considerations	This category includes cost considerations identified in the study but not necessarily included in the cost of ownership model. This includes the cost of unplanned downtime, time to market, and backward compatibility considerations.

Table 1: Description of Cost Categories Included in Research and Analysis



A Word on Methodology

Crimson's cost analysis included research on pricing and licensing policies, as well as detailed interviews with staff at ten organizations representing 16 unique application server deployments that included Oracle WebLogic Server and JBoss. The interviewees, primarily system administrators, developers and technical managers, were selected based on their hands-on operational experience with each application server, and in many cases, with both application servers. Of the 10 interviews completed:

- 4 had active WebLogic Server and JBoss application server deployments of comparable size and scope
- 2 had active WebLogic Server deployments and have recently performed in-house evaluations of JBoss
- 2 had active WebLogic Server deployments only
- 2 had active JBoss deployments only

For broad representation, Crimson chose medium to large firms from industries including education, financial services, government, media, oil and gas, publishing, technology, and telecommunications. Table 2 shows statistics for the "typical" application server deployment in this study.

Element	Average of Participating Companies
Average # of CPUs	94
Deployments Using Clustering	93%
Average # of FTE Administrators	3.25
Average # of FTE Developers	95

Table 2: Average Environment Size and Staffing

At each site, Crimson asked IT administrators a series of detailed questions regarding installation, configuration, patching/upgrading, deployment, cluster setup/configuration, instance creation, session management, monitoring, and tuning. We also collected information on key management activities, including duration, frequency, and skill level required to complete the activities. We paid particular attention to the different responses for WebLogic Server and JBoss from those implementation sites that had both in production. (See Appendix for the detailed buildup of the people costs associated with implementation and operations.)



5-Year Cost Summary

Table 3 outlines the pro forma costs for a typical application server deployment, consisting of 5 server hosts (server blades with two dual-core processors each), running an average of 4 application server instances per host (one instance per core). The acquisition and on-going costs in Table 3 reflect current list prices for hardware, software and support, less an average discount of 25%, while the people costs for implementation, deployment, testing, administration, and management are based on the results of Crimson's primary research and resulting cost model.

Cost Category (\$000s)	WebLogic Server	JBoss App Server	Cost Difference
Acquisition (Hardware & Software)	\$212	\$30	JBoss is 86% lower
Implementation	\$83	\$182	JBoss is 119% higher
Ongoing Application Deployment & Testing Costs	\$226	\$335	JBoss is 48% higher
Ongoing Vendor Support Costs	\$206	\$166	JBoss is 20% lower
Ongoing Administration & Management Costs	\$423	\$880	JBoss is 108% higher
Ongoing Monitoring, Diagnostics, & Tuning Costs	\$346	\$424	JBoss is 23% higher
TOTAL	\$1,496	\$2,017	JBoss is 35% higher

Table 3: Summary of Typical 5-Year Cost of Ownership Analysis by Category



Initial Costs: Acquisition and Implementation

There's no way around it: free is cheaper than not-free. In our typical example, a company will pay \$187,000 for the Oracle WebLogic Server software license and nothing for JBoss. However, acquiring software and deploying production-quality software that operates to functional specifications are two entirely different things, particularly if clustering is involved.

"Once you talk about clustering, then there are technologies that come with WebLogic that just aren't available in JBoss, like Oracle's Coherence inmemory data grid. When WebLogic says that it can cluster, it actually can cluster. We've never seen people successfully cluster JBoss and have it work."

IT Manager, Top 3 Global Ratings Agency

The basic application server installation costs were similar (and both small compared to the TCOs for each system), but there was a substantial difference in effort for the installation of management software. With Oracle WebLogic Server, the management software is included and installed with the application server, whereas with JBoss it requires separate installation of other open source management tools if customers want to have comprehensive management and administration beyond basic monitoring – an installation that averaged over three days of effort (26.4 hours).

Moreover, all of the JBoss deployments in our interview sample involved creating custom scripts or utilities, purchasing additional management components, integrating other open source components, and even – in a few cases – customizing the JBoss application server source code, which in turn leads to increased annual maintenance subscription costs. The average skill-adjusted effort for customizing JBoss was 381 hours – 9.5 weeks of effort. This compares to zero additional hours for configuration and customization of WebLogic Server – a significant difference in time and cost.

"The JBoss administration console just wasn't mature. There was a lot of custom configuration that needed to be done in order to set up servers. It just wasn't intuitive. And they didn't come up with an explanation for it, even during the training class."

Systems Architect, Technology Services Provider

Two key areas of configuration in which WebLogic Server demonstrated substantial advantages in our interviews were containerlevel configuration and cluster configuration. WebLogic Server provides tools to automate such tasks, including the WebLogic Clustering Configuration Wizard, while JBoss customers had to spend a significant amount of time writing their own custom scripts.

"Clustering with WebLogic is easier; there is no doubt about it."

- System Admin at global media company (active deployments of WebLogic & JBoss)



Finally, WebLogic Server's performance advantage, aided by JRockit JVM, resulted in lower capacity and performance requirements for hardware and CPUs, which in turn lowers hardware acquisition and maintenance costs, as well as ongoing environmental costs for power and cooling. Our research did not cover Oracle's Coherence distributed grid technology, which is widely used in many application environments to further increase the performance of WebLogic server over JBoss, and hence could further reduce the platform costs of deployment.

"WebLogic has by far the fastest JVM implementation in JRockit. So performance was definitely a factor. Their scalability across nodes is superior to JBoss in many, many respects."

IT Manager, Top 3 Global Ratings Agency

Table 4 shows the total costs of implementing, configuring, and customizing the two application servers. Key takeaways are:

- JBoss implementation costs more than twice as much as WebLogic Server implementation.
- By the end of the implementation phase, the cost of JBoss (inclusive of acquisition cost) is within 33% of the cost of WebLogic Server and operations haven't started yet.
- Though we haven't tried to quantify the business cost of the delay in time-to-value associated with an extra 8.5 weeks of effort, it could clearly be substantial.



Table 4: Cost Comparison & Key Assumptions for Implementation

Acquisition and Implementation Costs

WebLogic Server

Hardware: Cost includes 5 blade servers with 2 dual-core CPUs each @ \$5,000.

Installation*: 5 host servers plus management software: 30 hours.

Configuration*: 263 hours in first year for configuration, cluster configuration, and instance creation and cloning.

Initial Testing & Deployment*: 201 hours in first year for middleware interoperability testing; 60 developer and 34 administrator hours per application for deployment.

*Skill-adjusted effort index based on average/normalized primary research. See Appendix for additional primary research details.

JBoss Application Server

Hardware: Cost includes 6 blade servers with 2 dual-core CPUs each @ \$5,000; additional server required to account for 20% performance delta.

Installation*: 6 host servers plus management software: 71 hours.

Configuration & Customization*: 337 hours in first year for configuration, cluster configuration, and instance creation and cloning; PLUS 381 hours of development effort for custom scripts & toolkits.

Initial Testing & Deployment*: 281 hours in first year for middleware interoperability testing; 77 developer and 69 administrator hours per application for deployment.

*Skill-adjusted effort index based on average/normalized primary research. See Appendix for additional primary research details.



JBoss costs more than **twice as much** to implement as Oracle WebLogic Server.

Ongoing Operations

By far the greatest costs in a long-term deployment of application servers are the ongoing operational costs for application deployment and infrastructure testing, support, management and administration, and monitoring, diagnostics, and tuning. Open source software in general is less expensive for annual subscription than commercial software; in this case, JBoss is about 20% less expensive per year than Oracle WebLogic Server. Vendor support (or the equivalent open-source subscription), however, is only 8-14 percent of the 5-year TCO. If acquisition and implementation account for another 19 percent (WebLogic Server) and 9 percent (JBoss) of TCO, where does the remaining 70-80 percent of TCO come from, and what is the relative cost impact of each application server option?

Application Deployment and Infrastructure Testing Costs

In addition to the implementation costs associated with application deployment and infrastructure testing, Crimson's research identified substantive ongoing differences between the two systems in these areas, which affect both administrators and developers. These costs arise as new applications are rolled from development to test/staging to production, and as new releases of the application server are upgraded and released to production.

For application deployment, our research showed more than 20 percent skill-adjusted effort advantage for developers and more than 50 percent skill adjusted effort for administrators in WebLogic Server deployments as compared to JBoss deployments. Research participants identified better support in WebLogic Server for moving applications between Development, QA, Test, Staging, and Production environments. They specifically cited WebLogic Server's IDE and Web interface for helping to easily deploy applications to multiple machines in a cluster. Participants with JBoss relied on custom scripting, rather than on out-of-the-box functionality.

We estimated one major upgrade in our typical deployment, taking place in Year 4 for each system. Interviews indicated a 20 percent skill-adjusted advantage for WebLogic administrators for testing a new release of the application server stack, and a 29 percent advantage for middleware interoperability testing. Table 5 shows the year-by-year costs for deployment and testing costs for WebLogic Server and JBoss.







Application Deployment and Testing Costs

WebLogic Server

JBoss Application Server

Application Deployment*: 60 developer and 34 administrator hours per application.

Testing*: 349 hours for interoperability testing and testing of new releases and updates. Assumes major testing activities take place every three years.

*Skill-adjusted effort index based on average/normalized primary research. See Appendix for additional primary research details.

Application Deployment*: 77 developer and 69 administrator hours per application.

Testing*: 469 hours for interoperability testing and testing of new releases and updates. Assumes major testing activities take place every three years.

*Skill-adjusted effort index based on average/normalized primary research. See Appendix for additional primary research details.

Application Server Administration, Management, Monitoring, and Tuning Costs

Application server administration costs include the labor costs to manage, maintain, monitor, and optimize a production environment. These costs are the largest component of the 5-year TCO, consuming 29 percent of total costs for WebLogic Server and 44 percent of total costs for JBoss, and cover a wide range of activities, as shown in Table 6:

I aple 6: Administration and Management Activiti	Table 6:	Administration and Ma	anagement Activities
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- Upgrades
- Patching
- Environment configuration (Dev, QA, Stage, Production)
- Database Management
- Session Management/Failover

- Port Management
- Referring to online help/documentation
- App server backup and recovery
- Cluster management
- Distribution of management data (status, problems, resolutions) across team of admins



"The management tools that Oracle provides with WebLogic are fairly advanced and they integrate well with the Oracle Enterprise Manager that we use to monitor our database server. JBoss has a lot of open source tools that are available to help you do basic management, basic application monitoring. They're nowhere near as robust as a commercial solution."

IT Manager, Top 3 Global Ratings Agency

As with every other labor-driven cost in our survey, it takes a more-skilled (and hence more expensive) person more time to perform administrative and management tasks in the JBoss environment than it does for WebLogic Server. This results from two primary factors:

- 1. The management tools and administrative capabilities of the WebLogic Server platform are more mature than those of JBoss. The WebLogic Admin Console was cited by nearly everyone in the Crimson survey as providing an efficient GUI-based capability to configure and manage the application server environment. Other features that save time and effort for WebLogic Server administrators and developers (and save money for their employers) include JRockit Mission Control and the WebLogic Scripting Tool. Administrators also noted the relative ease of clustering, rolling upgrades of servers, and propagating changes across clustered environments in WebLogic Server as compared to JBoss.
- 2. The required level of experience and training to perform effective administrative activities is lower in the WebLogic Server environment than in the JBoss environment. On average, a JBoss administrator with more skills and training has to spend more than twice the number of hours per month to accomplish the same tasks as his counterpart in the WebLogic server environment (see Appendix for detailed hours versus skill-level comparison). JBoss' more technical environment requires in-depth knowledge of the location, structure, and functions of numerous XML files and a Do-It-Yourself (DIY) ability to configure and integrate project components. Furthermore, many JBoss environments result in a customized infrastructure that puts an additional premium on an administrator's personal libraries and knowledge knowledge that may be lost with personnel changes.

"The JBoss people really have catching up to do with their management tooling. They've got just a very simple, very stripped down admin console. If you just want to do general day-to-day admin tasks, it would be great, but when the rubber hits the road, it falls on its face."

Systems/IT Administrator, Vehicle Loan Provider



Monitoring, Diagnostics, and Tuning Costs

In similar fashion to the Administration and Management capabilities, Oracle WebLogic Server provides features and capabilities for optimizing and trouble-shooting the application server environment that do not have comparable offerings in JBoss' open-source environment, including:

- WebLogic Diagnostics Framework
- WebLogic JRockit Mission Control System
- WebLogic Advanced Diagnostics for Java Framework
- WebLogic Operations Control
- Oracle Process Manager and Notification Server

Table 7 shows the activities included in our analysis of this set of tasks:

			Table 7: Monitoring, Diagnostics, and Tuning Activities							
✤ □ ♠ N	Data source connection pool tuning Monitoring performance of the application server environment	* *	Ensuring service levels are being satisfied Determining trends or establishing baselines in performance levels based on historical data							
♦ N e ♦ E	Monitoring performance of the application's real and-user experience Diagnosing and locating performance problems	*	Configuring tool to receive alerts and notifications							

Though less dramatic than the differences in Management and Administration, these capabilities still create a skills and time gap between optimizing WebLogic Server and optimizing JBoss: The net average difference in our survey was a nearly 25 percent cost advantage for WebLogic Server (see Appendix for details).

"It is much easier to diagnose performance problems, determine where the bottlenecks are, and resolve them quickly with the tools that WebLogic provides than with JBoss. We spend 35 percent less time on these activities in WebLogic as compared to our JBoss environment."

Systems Administrator, telecommunications firm (active deployments of both WebLogic & JBoss)



JBoss costs **70 percent more** over 5 years to maintain and optimize than WebLogic Server.

Table 8 shows the annual difference between the operating costs of WebLogic Server and JBoss, when the costs of Administration and Management are combined with the costs of Monitoring, Diagnostics, and Tuning.



Table 8: Five-Year Operating Cost Comparison

Application Server Administration, Management, Monitoring and Tuning Costs

WebLogic Server

JBoss Application Server

Application Management*: 372 hours per year, at skill factor of 1.0. Application Management*: 775 hours per year, at skill factor of 1.07. Performance Management*: 429 hours per year, at skill level of

0.99 Staffing Baseline: .83 FTE Administrators for Application Management and .68 FTE Administrators for Performance

Management. Staffing for Year 1 is 50% of Years 2-5 due to initial deployment time.

*Skill-adjusted effort index based on average/normalized primary research. See Appendix for additional primary research details.

Performance Management*: 525 hours per year, at skill level of 1.02.

Staffing Baseline: 1.72 FTE Administrators for Application Management and .83 FTE Administrators for Performance Management. Staffing for Year 1 is 50% of Years 2-5 due to initial deployment time.

*Skill-adjusted effort index based on average/normalized primary research. See Appendix for additional primary research details.

"We brought JBoss in for a side-by-side evaluation and found that, due to the automation capabilities in Weblogic Server, specifically the WebLogic Admin Console, our administrative team achieved a 1 to 2x efficiency advantage as compared to JBoss. Our operations/production management team, which has a higher turnover, achieved a 2 to 3x efficiency advantage."

Systems Administrator at Petroleum Company (WebLogic deployment; evaluated JBoss)

WebLogic Server JBoss



Cost Summary

Over 5 years, ongoing operations comprise 70-80 percent of the total cost of ownership of an application server deployment. In the typical deployment described and analyzed in this white paper, JBoss costs about 50 percent more to operate over the time period than does Oracle WebLogic server, as shown below. This operating summary in Table 9 includes all the costs of Deployment and Testing, Vendor Support and Maintenance, Management and Administration, and Monitoring, Diagnostics, and Tuning.



Table 9: Five-Year Implementing, Support and Operating Cost Comparison

What does this mean in terms of the total cost of ownership for the two application servers over 5 years, including the initial costs of acquisition and implementation? It means that Oracle WebLogic server holds a 35 percent cost advantage over Red Hat's JBoss, in spite of the fact that JBoss is "free." Recall that by the end of the Implementation phase, the cost of JBoss is within 33 percent of the cost of WebLogic Server – in our typical example, about a \$90,000 cost advantage, just as the application environment is ready to go to production.

Table 10 shows the cumulative costs over 5 years of acquiring, implementing, and operating WebLogic Server and Red Hat JBoss. The annual operating costs outweigh the acquisition costs by the end of the second year, with the consequence that, by end of Year 5, the TCO of JBoss is 35 percent greater than the TCO of WebLogic Server. In the typical example discussed in this white paper, the difference is about a half of million dollars – which makes "saving" on upfront license fees look somewhat short-sighted.

"I'd ask JBoss and Red Hat to invest a little bit more in their product. If they want it running enterprise-level applications, they need to make sure they're providing an enterprise class product."

Systems Architect, Technology Services Provider



Table 10: Five-Year Cumulative Total Cost of Ownership Comparison (in \$000s)

"JBoss was marginally cheaper, especially if we hadn't have had to pay for support. So, if we had been just going with, 'Take some software, use it and pray everything works,' JBoss certainly would have won. Or, if we'd had enough internal developers who were comfortable developing a large enterprise-level application using just JBoss and fixing any of the problems we ran into on our own, that may have been something that would have been much more key to the discussion. But neither of those things are really a factor. As far as things that JBoss did better than Oracle? Nothing was obvious to me. The developers may have found things that they liked better, but...for me, from an operational standpoint, a supportability standpoint and just from a quality-ofthe-product standpoint, WebLogic won.

Systems/IT Administrator, Vehicle Loan Provider

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Other Cost Factors to Consider

This whitepaper has evaluated the quantitative aspects of the total cost of ownership of application server deployments. In addition, the interviews highlighted other compelling cost of ownership issues that cannot be quantified across different vertical industries and applications, but can certainly influence long-term cost of ownership considerations.

The Cost of Unplanned Downtime

For applications that require continuous availability, minutes of unplanned downtime can result in millions of dollars in lost revenue. Several participants in our study cited anecdotes regarding the relative stability and performance of WebLogic Server and JBoss.

"If we miss our daily window for billing, it means a \$7mm cash flow hit to our bottom line. One of the key reasons for our choice to use WebLogic is the performance and reliability, because we simply cannot afford downtime."

Infrastructure executive, telecommunications (Active WebLogic deployment; did not evaluate JBoss due to availability concerns)

The Cost of Customized Infrastructure

Companies should evaluate whether or not they want to be in the software development and maintenance business with respect to their application server infrastructure. When an infrastructure is customized with numerous open source components that have varying release cycles, the owner of that infrastructure owns the responsibility for keeping all the different components up-to-date, compatible, integrated, and performing. When the infrastructure software comes from a commercial vendor who assumes responsibility for these tasks, the infrastructure owner can then focus its scarce development resources on applications and business logic to support their core business processes, and not infrastructural overhead.

"If I were to go to market and hire a JBoss systems administrator, I would advertise for a software engineer and train that person to manage my JBoss deployment. It's a fundamentally different skill set."

Infrastructure Executive, financial services (active deployments of both WebLogic & JBoss).

The Application Server Support Horizon

JBoss software lifecycles can present downstream cost challenges, as it typically has shorter support horizons than commercial software. This can force organizations to upgrade, or even to lose production-level support for their applications, before they are ready. This problem is compounded by JBoss' history of not offering backwardcompatibility in new versions. Areas that may be affected include a new Java messaging model, a new domain model inconsistent with prior single-cluster models, new distributed



caching and replication technologies, and significant changes to configuration files in different releases of the software. Consequently, a JBoss upgrade starts to look like a new JBoss installation – which as we have already seen, is a significant expenditure of time and money. Estimating the JBoss release cycle is beyond the scope of this study, but clearly if a customer were to do a version upgrade during any 5-year ownership span, the difference between a WebLogic Server upgrade with full backward compatibility and a JBoss upgrade would increase the already-substantial TCO advantage enjoyed by Oracle WebLogic Server.



Conclusion

Crimson's research and analysis of application server deployments demonstrates that the people costs associated with implementation, configuration, and ongoing operations comprise the vast majority of total costs of ownership. Due to several limitations inherent to JBoss, these costs are likely to always remain greater for JBoss versus WebLogic Server:

- "Out-of-the-box" configuration and implementation tools are more mature, robust, and efficient for WebLogic Server than for JBoss, with the result that time-to-value is faster, the customization needs lower, and the costs lesser than with JBoss.
- Similarly, out-of-the-box administration, management, and tuning tools have been through as many development cycles as the core software and are consequently more complete and more productive than their equivalents in the JBoss environment.
- Oracle takes on the responsibilities and costs of maintaining performance and backwards-integration as the software evolves; users of JBoss take on those responsibilities for themselves.

All these factors combine, with additional software-specific performance issues, to give a very different picture of the total cost of ownership in comparison to the initial acquisition costs. In fact, Crimson's analysis indicates Oracle WebLogic Server becomes less expensive on a TCO basis within two years from acquisition – an advantage that continues to grow with every year of operation. Over a 3-to-5 year time horizon, the TCO of Red Hat JBoss becomes as much as 35 percent more than WebLogic Server, in spite of its lower acquisition cost.

Crimson advises that executives should consider a broad range of cost factors beyond just the initial cost; in particular, those costs related to implementation, deployment, testing, and ongoing operational administration and management. In doing so, executives may be surprised at what a small portion of total costs are contributed by initial license fees.



About Crimson Consulting

We help executives achieve market leadership.

Crimson is a management consulting firm focused on marketing. Our clients include Adobe, Cisco, eBay, Hitachi, HP, IBM, Intel, Microsoft, Oracle, SAP, Seagate, Symantec and Verizon.

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Appendix A: Primary Research Results

Following is the aggregated results of our detailed primary research into the various activities for each area of the deployment life cycle.

Installation Activities

	WebLogic Server			JBoss			
Activity	Avg Time (total)	Skill Factor	Skill Adjusted Effort	Avg Time (total)	Skill Factor	Skill Adjusted Effort	
Scales Per Server							
App server Installation	5.3	1.00	5.3	6.7	1.10	7.37	
Scales Per Domain							
Mgmt software installation	3.5	1.00	3.5	24	1.10	26.40	
Total	Not Totaled Due to Different Scaling Factors						

Configuration/Customization Activities

	WebLogic Server			WebLogic Server JBoss			
Activity	Avg Time (total)	Skill Factor	Skill Adjusted Effort	Avg Time (total)	Skill Factor	Skill Adjusted Effort	
Scales Per Server							
App server Configuration	8.1	1.10	8.91	11.7	1.19	13.92	
Cluster Configuration	6.3	1.06	6.678	8	1.11	8.88	
Scales per Instance							
Instance Creation/ Cloning	6.3	1.01	6.363	6	0.94	5.64	
Scales per Environment							
Customization/ Custom Script Development	0	0.00	0	320	1.19	380.80	
Total		Not To	otaled Due to Dif	ferent Scaling Fa	actors		



Testing Activities

	WebLogic Server			WebLogic Server JBoss			
Activity	Avg Time (total)	Skill Factor	Skill Adjusted Effort	Avg Time (total)	Skill Factor	Skill Adjusted Effort	
Interoperability testing with middleware components	182.4	1.10	200.64	248.4	1.13	280.69	
Testing for new updates and releases to app server stack	148.8	1.00	148.8	177.6	1.06	188.26	
Total		1.05	349.44		1.10	468.95	

Application Deployment Activities

	v	VebLogic Serve	r	JBoss		
Activity	Avg Time (per Month)	Skill Factor	Annualized Effort (skill adjusted)	Avg Time (per Month)	Skill Factor	Annualized Effort (skill adjusted)
Application Deployment - Developers	5	1.00	60	7	0.92	77.28
Application Deployment - Administrators	2.7	1.05	34.02	6.1	0.94	68.81
Total		1.03	60		0.93	77.28



Management/Administration Activities

	WebLogic Server			WebLogic Server JBoss		
Activity	Avg Time (per Month)	Skill Factor	Annualized Effort (skill adjusted)	Avg Time (per Month)	Skill Factor	Annualized Effort (skill adjusted)
Upgrade(s)	3.8	1.1	50.2	4.5	1.1	59.40
Patching	2	1.1	26.4	3.5	1.18	49.60
Environment configuration between environments (Dev, QA, Stage, Production)	7.8	1.01	94.5	9	1.01	109.10
Database management	1.3	0.97	15.1	6.1	1.01	73.90
Session Management / Failover	1	0.92	11	7	1.19	100.00
Port Management	0.7	0.93	2.6	7.1	1.05	29.80
Referring to online help / documentation	2	0.86	20.6	8.3	1.05	104.60
App server backup and recovery	6	1.05	75.6	7	1.01	84.80
Cluster management	2.3	1.01	27.9	6.3	1.1	83.20
Distribution of management data (status, problems, resolutions) across team of admins	4	1.01	48.5	7	0.96	80.64
Total		1.00	372.4		1.07	775.04



Monitoring, Diagnostics and Tuning Activities

	WebLogic Server		JBoss			
Activity	Avg Time (per Month)	Skill Factor	Annualized Effort (skill adjusted)	Avg Time (per Month)	Skill Factor	Annualized Effort (skill adjusted)
Data source connection pool tuning	1.7	1.01	20.6	1.8	1.01	21.80
Monitoring performance of the application server environment	5	1.01	60.6	7.5	1.01	90.90
Monitoring performance of the application's real end user experience	10	1.06	127.2	6.5	1.00	78.00
Diagnosing performance problems and determining where the performance bottleneck lies (i.e., App Server, Database, Network)	12	1.04	149.8	17.5	1.14	239.40
Ensuring service levels are being satisfied	2	0.95	22.8	3.5	1.00	42.00
Determining trends or establishing base lines in performance levels based on historical performance Data	3	1.05	37.8	3	1.00	36.00
Configuring tool to receive alert notifications (e- mail, pager)	1	0.83	10	1.5	0.96	17.30
Total		0.99	428.8		1.02	525.40