



# JBoss ENTERPRISE MIDDLEWARE MIGRATION ASSESSMENT

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Red Hat Global Professional Services  
Customer X, XYZ Application

## SAMPLE ONLY

The following is a sample report of what is delivered at the conclusion of the JBoss Migration Assessment service. It is based on a real customer who migrated from BEA WebLogic to JBoss

Eventhough BEA WebLogic was the subject of this migration effort, Red Hat Profession Services can deliver migration assessments, enablement and implementation for any Java EE middleware to JBoss Enterprise Middleware. The service is delivered by JBoss Certified Consultants, typically in 3-5 business days. Additional time may be required based on overall project scope.

For a customized JBoss Migration Assessment for your business, please contact your Red Hat sales representative. The presentation format of the actual JBoss Migration Assessment report for your business may differ from this sample, but the same proven methodologies, best practices and expertise will be leveraged to ensure the best possible results.

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# PURPOSE

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The purpose of this document is to:

- Provide a means for insuring a common understanding of the current and target environment.
- Provide a means for insuring a common understanding of the migration project goals.
- Provide an in-depth analysis of the migration effort required to prepare one application for execution in JBoss Enterprise Application Platform Environment.
- Serve as Risk List, recommendations for risk mitigation where appropriate, and provide input for a high-level project plan.
- The Migration Assessment document is not intended to be used as a system architecture document, detailed design document, or a project plan.

# CAVEATS AND CONDITIONS

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All migration level of effort assessment are estimates made in good faith based on analysis of the customers application, application environment, and current staff skill levels. Red Hat the right to update estimates based on unexpected issues that may arise during the course of a migration project.

# EXECUTIVE SUMMARY

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This JBoss Migration Assessment details Level of Effort estimates, list of risks, and recommendations for risk mitigation regarding migration of the XYZ Application from BEA WebLogic Server to the JBoss Environment.

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## ASSESSMENT FINDINGS OVERVIEW

- The migration of the Web Services will be straight forward except for #2 below.
- The WebLogic specific "Stateful" Web Services will require some coding in the JBoss environment. A prototype solution was created and demonstrated.
- There are approximately 90 source code and configuration file references to WebLogic specific classes or jar files that must be eliminated. No major problems are anticipated with this task.
- The process of logging the JMS event messages to the "Stats" DB is a performance bottleneck. It is recommended that the Message Driven Beans that process the JMS queue be moved a separate server cluster where the asynchronous processing would not impact the Web Services processing.
- Security is not an issue for the migration.
- There are no Entity Beans to migrate.

## ESTIMATED TOTAL LEVEL OF EFFORT

This section reflects the total level of effort estimation in person hours. The details in subsequent sections of this document support this estimate. A line-item summarization is at the end of this document.

- XX to YY person hours



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# PROJECT SCOPE, ASSUMPTIONS, AND METHODOLOGY

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## PROJECT SCOPE

This scope of this document and this migration project is limited to the tasks involved in migrating the XYZ Application, selected by Customer X, from the BEA WebLogic 8.1 SP4 Application Server to the JBoss Enterprise Application Platform v4.2.

The project scope includes:

- Installation and configuration of the JBoss Enterprise Application Platform.
- Migration of the application to eliminate all WebLogic dependencies.
- Migration of deployment descriptors and configuration files needed to deploy in the JBoss environment.
- Migration of build scripts as needed to build the various deployment components.
- Deployment/operations training including performance tuning and best practices.

The scope of this review and assessment includes:

- Review and Analysis of existing source code
- Review and Analysis of existing architecture
- Review and Analysis of existing build system and build scripts
- Review and Analysis of existing development and deployment process/methodology.
- Documentation of:
  - Level of effort estimate
  - Risk list and risk mitigation recommendations
  - Description of pre-migration Application Architecture and technologies
  - Description of Candidate Application Architecture
  - High-level task list

The project does not entail efforts related to migrating other applications to JBoss. Future migration efforts beyond the XYZ Application will be covered in a future assessment.

## ASSESSMENT METHODOLOGY

The following steps were executed to produce this in-depth assessment of the migration effort required to move XYZ Application from BEA WebLogic to JBoss:

- **Requirements Analysis Phase:** Review and analysis of existing environment, architecture, design, and technologies used
  - Migration motivations, business and technical goals
  - Determine the level of involvement the customer desires
  - Determine operational goals of the migration
  - Review application architecture and technologies employed
  - Identify the relevant application source code
  - Identify target infrastructure features and requirements
  - Identify and propose JBoss Application Platform configuration
- **Inventory and Source Code Review Phase**
  - Identify Application Frameworks employed (e.g. Spring, Hibernate, etc) and third-party libraries used
  - Identify any non-standard J2EE extensions used by the application (e.g. BEA Stateful Web Services Support)
  - Identify existing anti-patterns that will inhibit performance, scale, or exacerbate the degree of difficulty
  - Identify portability issues.
  - Review service infrastructure (Security, Messaging)
- **Estimation, Planning, and Documentation Phase**
  - Level of effort estimate
  - Risk List and Risk Mitigation Recommendations

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## MIGRATION ASSUMPTIONS

The success of the migration depends on close cooperation between the migration team and the client. The estimates for migration effort are based on the following assumptions:

- Customer X will provide technical contacts for the JBoss Certified Consultants to call or email with questions. Quick turnaround is critical to remaining on schedule.
- Application XYZ will be frozen (or a stable snapshot provided) during the migration of that application. Migration can be scheduled to fit into the client's application enhancement needs.
- All third-party libraries or packages are JBoss compliant.
- Application XYZ will be migrated "as is." Other than the refactoring required to eliminate WebLogic dependencies, there is no refactoring of code to fix existing bugs or improve design or performance. Refactoring opportunities will be identified and an effort estimate will be made for a separate project above and beyond the migration project.
- Existing WSDL's exposed by the XYZ Application will remain unchanged.
- The migration will be to the JBoss Enterprise Application Platform v4.2 running on Sun JDK 1.5 (5.0)



- Existing JUnit testing frameworks will be migrated if necessary to reflect refactoring changes.
- Monitoring and Operations will be integrated into existing Monitoring capabilities by Customer X.
- A development test environment will be available where the JBoss Certified Consultants can run the migrated application to observe correct operation functionality.
- QA and performance testing will be performed by the Customer X's QA team with direct support from the JBoss Certified Consultants. It is also assumed that there are documented test results or benchmarks established for the current BEA WebLogic deployments.



# ARCHITECTURE & ENVIRONMENT

## PRE-MIGRATION ENVIRONMENT

This section documents the environment as it was found before beginning any migration tasks.

## LOGICAL VIEW

The Logical View shows large grained application components and topology. Each node represents a functional component of the application such as data sources, presentation, workspace, service, domain, and external dependencies the application might have.

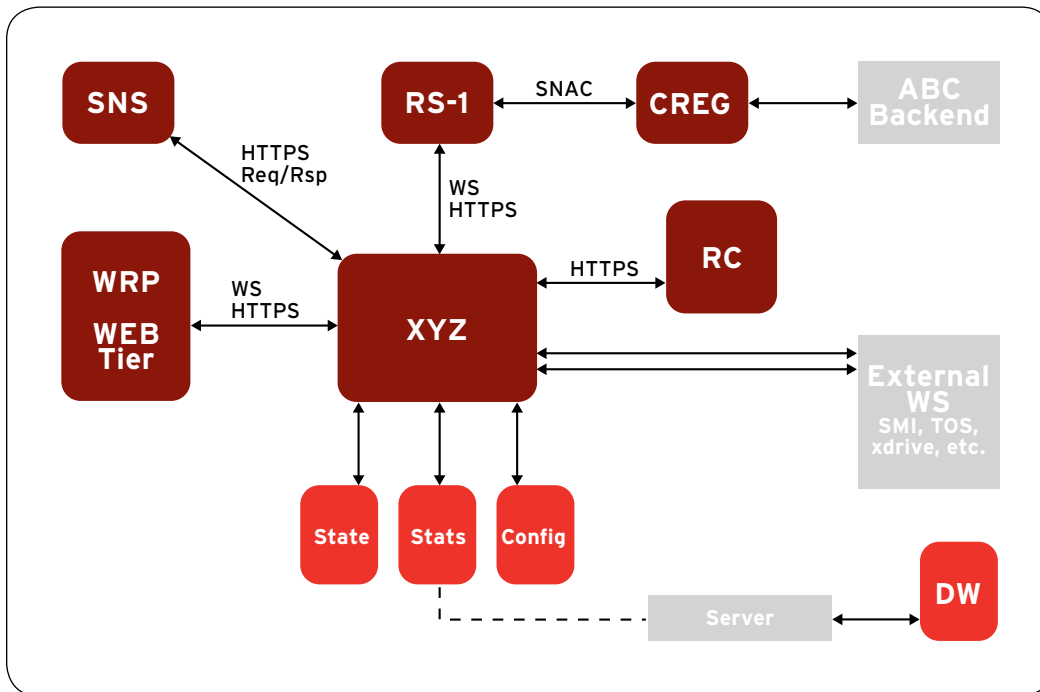


FIGURE 1 - LOGICAL PERSPECTIVE DIAGRAM

## PHYSICAL SERVER TOPOLOGY

Customer X provided a physical server deployment of the XYZ Application servers and its interfaces to other servers. It showed that the clustered environment currently consists of three application servers.



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## SOFTWARE DEPLOYED

Current environment software versions:

Category	Product	Version
Operating System	Red Hat Linux	3.x (Taroon Update 6)
Application Server	BEA WebLogic Server	8.1 SP4
Standards & Specifications	J2EE EJB	1.3 2.1
HTTP Server	Apache Web Server	2.0.54
Database Instances	Sybase	ASE 12.5.3
Messaging	BEA WebLogic	8.1 SP4 - JMS 1.0.2
JDBC Drivers	BEA Sybase	Type 4: 11.x, 12.x

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## CANDIDATE TARGET ARCHITECTURE

This section describes the candidate target architecture.

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## LOGICAL VIEW

Initially, the target environment will mimic the existing server topology for the XYZ Application. Each cluster will consist of 3 clustered application server nodes.

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## SOFTWARE DEPLOYED

Target environment software versions:

Category	Product	Version
Operating System	Red Hat Linux	4x
Application Server	JBoss Enterprise Application Platform	4.2
Standards & Specifications	J2EE EJB	1.4 2.1 w/ EJB3 MDB
HTTP Server	Apache Web Server	2.0.54/mod_jk 1.2 (APJ 1.3)
Database Instances	Sybase	ASE 12.5.3
Messaging	JBossMQ	4.0.5 GA - JMS 1.1
JDBC Drivers	Sybase	Type 4

# MIGRATION TASKS

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## ASSUMPTIONS

The following tasks are assumed to have occurred or will occur before the migration effort begins

- VPN Access for migration specialist(s) and other remote team members
- Source Control (CVS/SVN) Access - Application XYZ branch creation
- Visibility and reachability of server hardware hosts used for development, unit testing, system/integration test, and QA. The same for external services such as LDAP and data services when used.
- JDK & JBoss versions as required for development, testing, and QA installed
- Project Management structure is in place

The identified tasks documented in this section have two levels of granularity. The first level identifies heavy-grained tasks that are relevant to most J2EE platform migrations. Subsequent sub-sections separate tasks into areas of concern.

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## GENERAL MIGRATION TASK LIST

The task list is derived from the analysis phase of the engagement. It summarizes the heavy-grained tasks and best practices to observe. There is no LOE provided with the general list. This list is iterated in the subsequent sections to derive details and LOE estimates.

- Obtain performance benchmarks for pre-migration environment
- Prototype any difficult functionality
- Build System and Configuration Management
  - Create build and deployment scripts
  - Use JBoss IDE Packager
- Migrate deployment descriptors and service bindings
  - JCA Connectors
  - Queue destinations
  - Web Service Bindings and WSDL (if any)
- Migrate source code
  - Eliminate proprietary dependencies
  - Find alternative packages to replace incompatible packages. Where no alternatives are found, re-factor the code.
  - Document all changes
- Unit Test all changes
- Deploy Application in Development test bed, benchmark, and profile performance
- Provide Training\Transfer of Information to QA\Support as needed
- Support QA Installation, Tuning and Testing Efforts

## DETAILED SOURCE FILE MIGRATION TASKS

The following tasks were performed at the source code level to identify any anomalies that might demand custom solutions and any proprietary dependencies.

- Obtain correct version of source code
  - Identify any changes necessary to compile and run using JDK 1.5
  - Eliminate WebLogic dependencies
    - Convert JNDI initial context methodology
    - Eliminate WebLogic-specific import statements
    - Re-factor the adapters
    - Eliminate WebLogic specific jar file dependencies in builds
    - Eliminate WebLogic specific Java doc
  - Misc. Refactoring
    - Move the MDB to EJB 3
  - Replace WebLogic proprietary "Stateful" Web Services functionality
    - Develop interceptor code to emulate the "Stateful" functionality
    - Eliminate the "State" db - replace with JBoss Cache based solution
  - Identify and implement WS Client solution for the "outgoing" WS interfaces
  - Re-factor the Startup classes to use standard Servlet Context listeners
  - **Effort Estimate: XX to YY hours**
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## APPLICATION SERVER AND DEPLOYMENT DESCRIPTOR MIGRATION TASKS

The following tasks need to be performed at the application server level in order to successfully move to the target environment.

- Install JBoss EJB3 and AOP components (Creating an installation template)
  - Log4j tweaking
  - Set up Sybase Data Source Descriptors (for Dev lab environment)
  - Set up JMS Queue Destination Descriptor
  - Tomcat Configuration & Tuning as needed
  - Deployment descriptor transformations
  - **Effort Estimate: XX hours**
- 

## DEVELOPMENT TESTING TASKS

The following tasks need to be performed in the development test bed.

- Standalone Instance testing
  - Installing JBoss/EJB3
  - Installing the XYZ Application (Configuration files/Ear file etc.)
  - Define test scripts (Supplied by client)
  - Verify functionality
  - **Effort Estimate: XX to YY hrs, Risk: Excessive test script/driver work**



- Deploying in Clustered environment
    - Install JBoss/Configure for clustered environment
    - Verify functionality in clustered environment - validate fail over
    - **Effort Estimate - XX hours**
  - Security
    - Secure the JMX console and web console
    - **Effort Estimate: XX hours**
- 

### QA TESTING TASKS

The following tasks need to be performed in the Quality Assurance test bed.

- Support Installation/deployment in QA environment
  - **Effort estimate: XX hours on site - YY hours remote support (part time)**
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### DOCUMENTATION TASKS

The following documentation will be provided.

- What changed document
    - Detailed list of changes made to migrate to JBoss.
  - Transfer of Information presentation
    - Training level presentation to train QA and Support teams on JBoss installation\ deployment of XYZ Application
  - **Effort Estimate: XX hours**
- 

### TRAINING TASKS

- Conduct on site XYZ Application Transfer of Information, Tuning & Best practices.
- **Effort Estimate: XX hours per attendee**

Recommend public training classes for Customer X staff:

- JBoss Administrator Training Class (RHD-336)
- JBoss and EJB3 for Developers Class (RHD-161)
- JBoss Advanced for J2EE Developers Class (RHD-261)
- JBoss Clustering Class (RHD-439)

# ISSUES, RISKS AND RISK MITIGATION



- The application is not frozen - ongoing changes will need to be managed and merged into the JBoss “stream” along the way.
  - Mitigation: Freeze the application source artifacts
- WS Client choice - many to choose from
  - Mitigation: Make a choice
- “Stateful” WS replacement - several approaches viable.
  - Mitigation: Review and analysis required
- Training availability
  - Mitigation: Register as early as possible to assure seats are available at the time required

## LEVEL OF EFFORT SUMMARIZATION

Level of effort is described in man hours and presented as a range. This estimate is an estimated guess of man hours required to migrate the application to the JBoss Enterprise Application Platform. Level of Effort should be estimated again when a project plan and detailed tasks are defined. All estimates are presented in man hours.

### EFFORT SUMMARY

Task	Low Range	High Range
Source File Migration	XX	YY
App Server and DD Tasks	XX	YY
Dev Testing Tasks	XX	YY
QA Testing Tasks	XX	YY
Documentation Tasks	XX	YY
Client Training and Knowledge Share (assumes 5 seats 32 hrs per seat)	XX	YY
<b>Total Hrs</b>	<b>XX</b>	<b>YY</b>