

RED HAT

SOA

THE COMPLETE GUIDE

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Foreword by Craig Muzilla



CRAIG MUZILLA
Vice President and General Manager,
Middleware Business Unit, Red Hat

As enterprises shift their focus from cost reduction to cost management, many find themselves in unfamiliar territory. In the past, the options for IT investment were clear. Some embarked on major proprietary software package implementations, while others built on the legacy systems they've trusted for years. Today, the appetite for large investments is gone, but enterprises still need to move forward and stay ahead of the competition.

Service-oriented architecture (SOA) allows the integration of existing legacy systems, applications, and users into a flexible architecture that can easily accommodate changing needs. SOA can enable great agility, productivity, and cost savings, but not when it's implemented with complex, closed, and expensive enterprise platforms.

Red Hat has a better way. We think SOA should be simple, open, and affordable.

SIMPLE. Red Hat provides simple-to-procure and easy-to-consume open source engines, frameworks, stacks, and component architectures that allow developers, ISVs, and enterprises to create solutions that realize the benefits of SOA.

OPEN. Open source is more flexible, and the licensing model offers more value and freedom. Red Hat also delivers standards-based products, further supporting its open focus and enabling greater flexibility.

AFFORDABLE. Red Hat subscriptions enable enterprise SOA deployments to realize greater value by eliminating expensive license fees while delivering high-quality developer assistance, production support, superior deployment experience.

Many traditional vendors are approaching SOA with the same tired, expensive proprietary extensions and closed source code that focuses on customer lock-in instead of customer value. Open source SOA facilitates greater agility, productivity, and cost savings with the enterprise-class stability and reliability your organization needs. Take a closer look at JBoss® SOA, and learn how you can realize the benefits of open source SOA today.

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Why Red Hat?

Red Hat understands the open source development process better than anyone, and we collaborate with our customers every day to make sure our technology solves their problems. That combination means Red Hat is uniquely successful at making the rapid innovation of open source reliable, relevant, and ready to work in mission-critical enterprise deployments.

We drive innovation by channeling it and setting it free, guiding and working within open source communities to make sure our customers get what they need.

HERE'S HOW IT WORKS:

2 RED HAT EXISTS SO THAT ENTERPRISES CAN DO MORE WITH LESS

We help enterprises take full advantage of the capability and efficiency of open source. Especially when budgets are tight. We can help you cut costs and do more with the technology you already have.



1 IT STARTS WITH TRANSPARENCY

The development process is open. The technology is open. There are no secrets, no surprises, no lock-in.



3 YOU ALWAYS HAVE A CHOICE

Our solutions are delivered via a low-cost, predictable subscription that includes services, upgrades, patches, and other improvements. Because the software is open source, you always have the option to switch providers if we don't deliver the value you expect.



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4 OPEN SOURCE MAKES BETTER SOFTWARE FASTER

Red Hat technology is built in collaboration with our rapidly growing open source community. The developers for our emerging technologies—including Fedora—and our JBoss Community projects—create cutting-edge technologies that are enterprise hardened for our platform and middleware solutions.

5 OUR DEVELOPMENT MODEL IS DIFFERENT

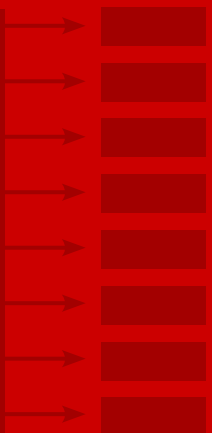
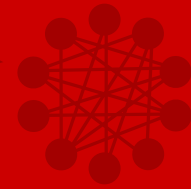
We collaborate with the open source community to develop technology that makes its way into our emerging technologies. This technology makes its way into Red Hat® Enterprise Linux® and JBoss Enterprise Middleware. This innovation returns to the community. The cycle is continuous.

6 WHICH IS WHY WE WORK TO KEEP KNOWLEDGE OPEN

Transparency. Collaboration. The free exchange of knowledge and ideas. Open source is more than a development model—it's who we are.

7 WE OFFER COMPLETE SOLUTIONS

From platform to virtualization, cloud computing, and middleware, Red Hat offers a complete open source solution throughout the entire stack. And the training and services to manage it all.



8 WITH THE POWER OF A BROAD ECOSYSTEM

We collaborate with our partners to deliver certified hardware and software that you can trust.



9 AND THE CAPABILITIES OF A GLOBAL PROVIDER

We have 66 offices in 29 countries. Our service is there when and where you need it, delivered by solution experts.



10 JUST ASK OUR CUSTOMERS

Some of the world's largest organizations rely on Red Hat every day. Especially in the most demanding environments like the New York Stock Exchange and the Chicago Mercantile Exchange.

Learn more: customers.redhat.com



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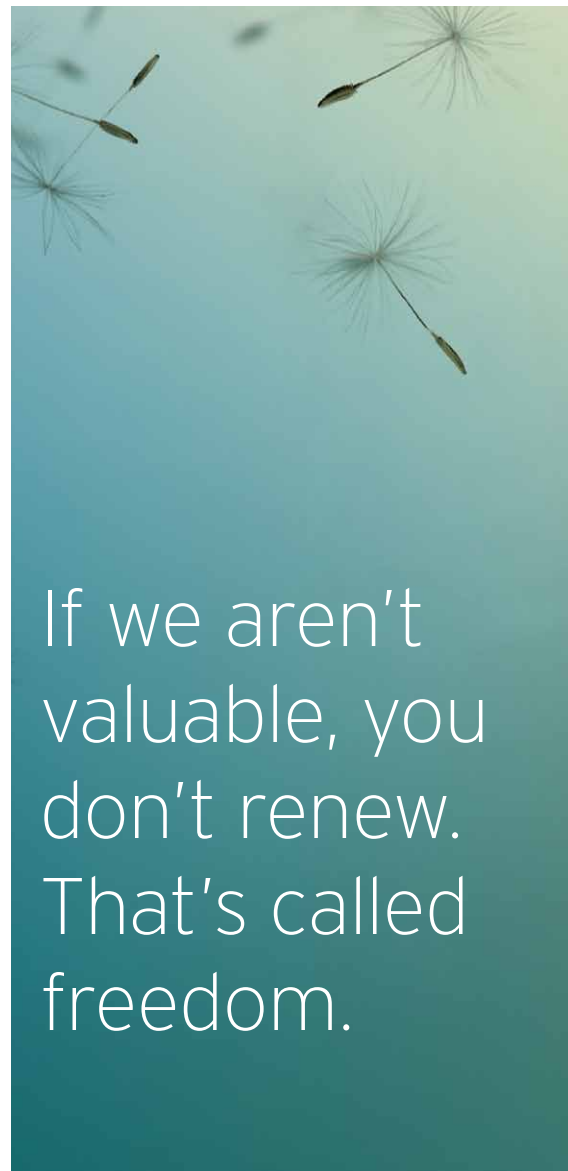
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Why subscriptions?



If we aren't valuable, you don't renew. That's called freedom.

In the traditional method of software delivery, the vendor is in control. Upgrades are costly. Access to help is limited. And there's not much incentive for the vendor to improve the software between upgrades.

In contrast, our subscription model allows Red Hat to create a mutually beneficial, cyclical relationship with our customers:

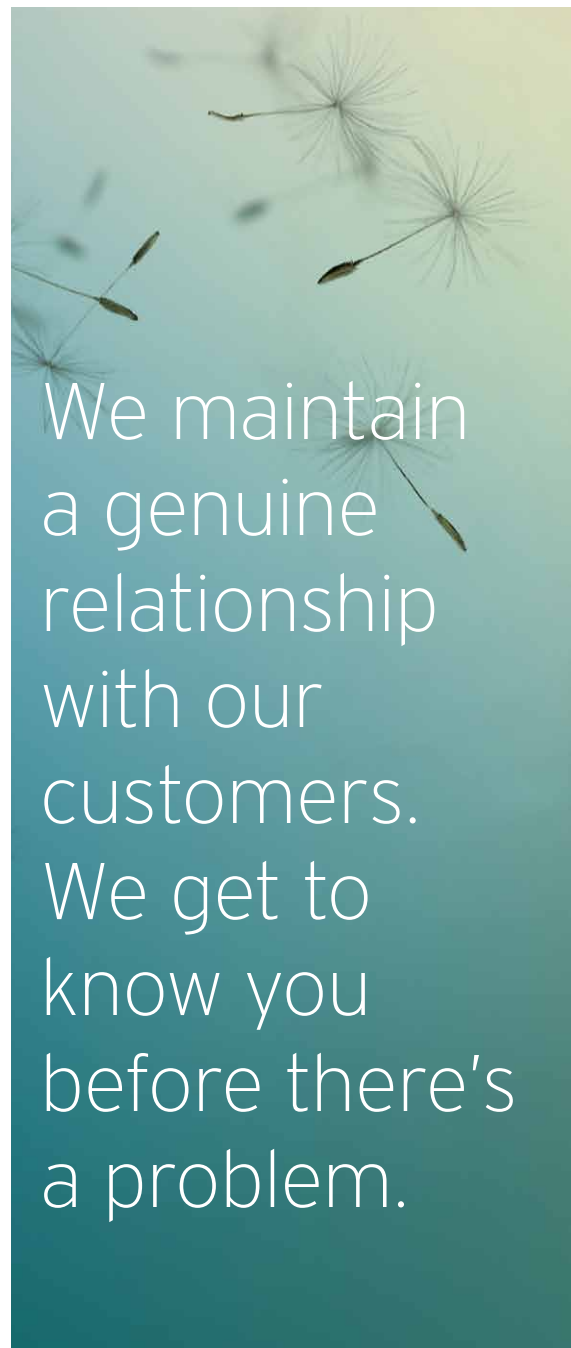
- First, we deliver new technology as soon as it's available.
- Then we provide unlimited support at no additional cost.
- And finally, the feedback and insights we gain from regularly working with our customers today help us deliver the better, more relevant, and useful technology you're going to need tomorrow.

Each product version is supported for seven years, so you benefit – and upgrade – at your own pace. A subscription means you receive ongoing return on your investment.

World-class support

Your subscription includes continuous service and support, which means we can help your systems remain secure, reliable, and up-to-date. When you have a question, you have a choice. You can speak directly with a Red Hat Certified Engineer®. You can search our technical knowledgebase. And you can feel certain you're entitled to superior support, because if you're not satisfied, we know you'll choose not to renew.





A better way of making software. A better way to pay for it.

Traditional software licenses lose value over time. But with the subscription model, you pay as you go, and the value returns to you over the lifetime of the subscription in the form of updated features, security enhancements, and additional hardware and software support. You reduce your financial risk by having predictable IT costs.

The subscription model lets Red Hat maintain a genuine relationship with our customers. We get to know you before there's a problem. And that means low-cost, high-value computing.

A Red Hat subscription is the most effective way to deploy, manage, and secure open source technology. It's a perfect complement to the rapid innovation of open source.

How does Red Hat sell software?

Red Hat sells subscriptions that entitle you to receive Red Hat software and services during the period of the subscription (generally one or three years).

What do you receive with a subscription?

For each software subscription, you receive:

- **Software access** – Access to the latest versions of Red Hat software that have been certified by thousands of independent software and hardware vendors.
- **Software maintenance** – Access to updates, upgrades, corrections, and bug fixes for the software.
- **Security** – Rapid response to potential software security issues.
- **Production support** – Access to Red Hat technical support.
- **Open Source Assurance** – Participation in the Red Hat intellectual property assurance program: redhat.com/legal/open_source_assurance_agreement.html

These benefits continue during the term of a subscription.

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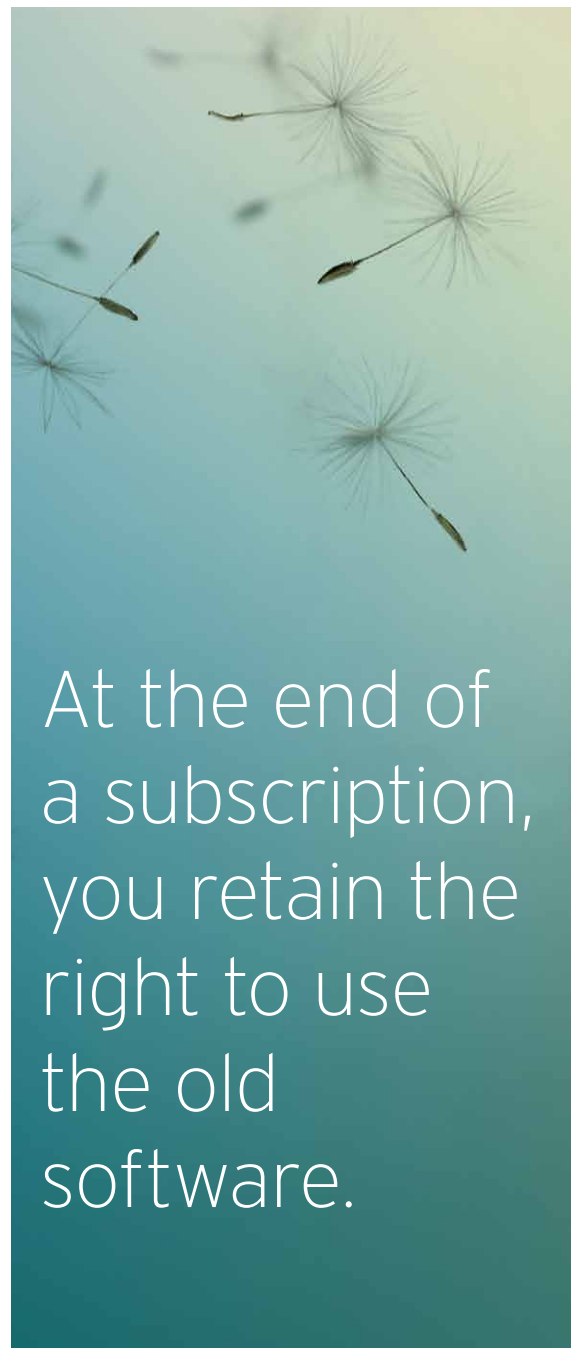
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How does Red Hat charge for software subscriptions?

We measure the value of Red Hat software subscriptions by counting the number of instances of Red Hat software that you use. So, while you have subscriptions for a Red Hat product, you are required to purchase subscription services for every unit of Red Hat software you use.

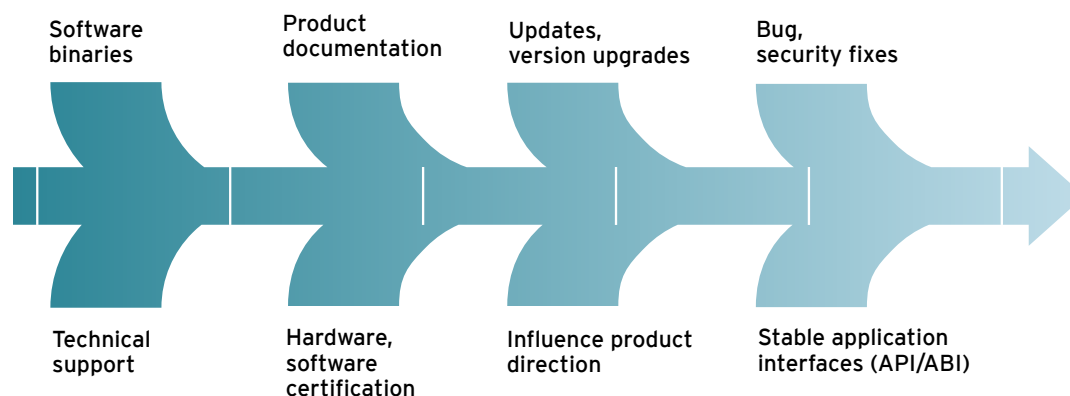
What happens at the end of a subscription?

The subscription, and all of the associated benefits, expire if not renewed. This means you would no longer be able to access the latest certified versions of the software, receive security errata or bug fixes, contact Red Hat for support, or receive the benefits of Open Source Assurance.

What happens to the software code at the end of a subscription?

You retain the right to use the old software, but all the benefits of the subscription expire, including certification of third-party hardware and software.

Learn more: redhat.com/about/whysubscriptions



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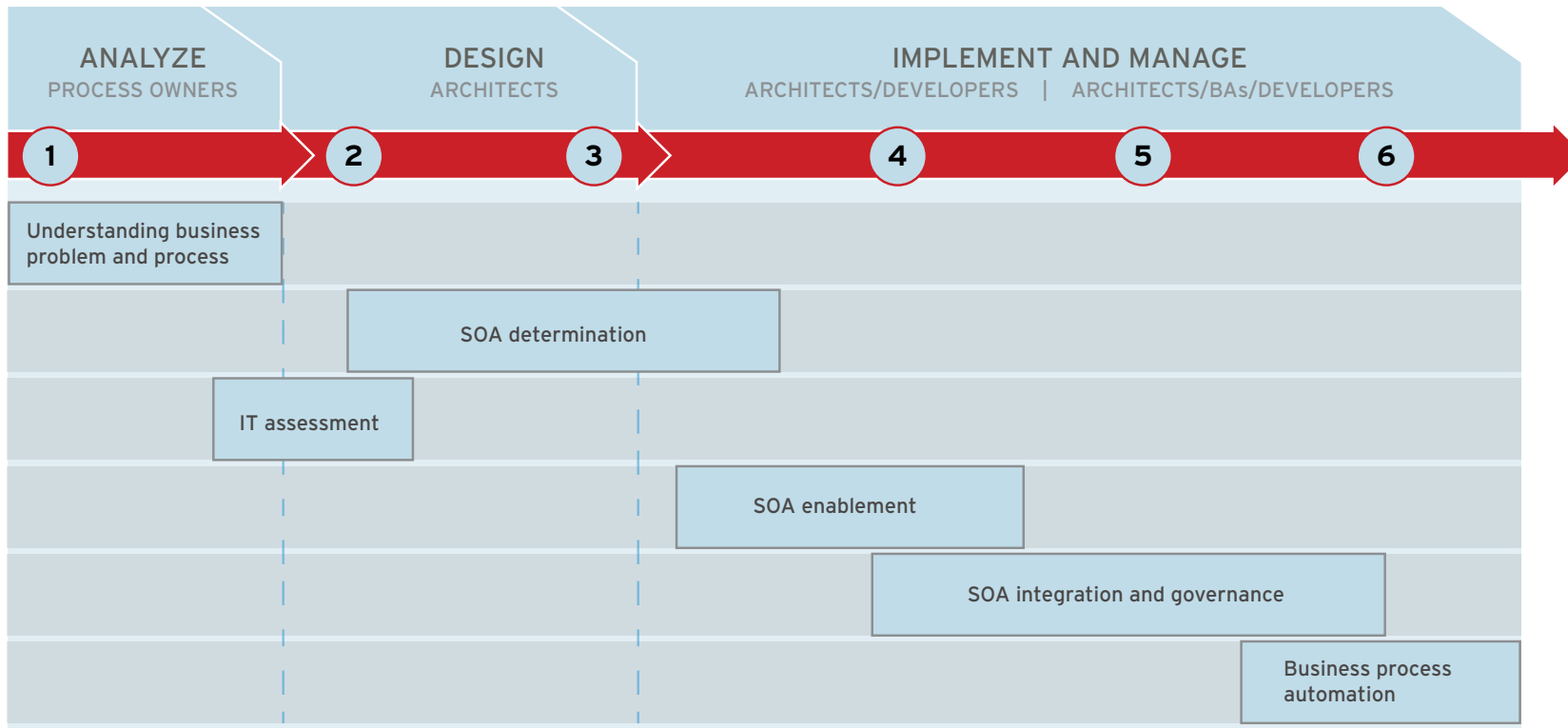
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6 Steps to improving business execution with SOA



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There are six steps of development an organization must make to efficiently incorporate SOA into its IT infrastructure.

Analyze and design

Step 1: Understand your current business processes

A business must understand how work is done before they can implement improvements. The current workflow needs to be analyzed and the participants in a business process must gain understanding of the current state.

Key players: Business process owners

Step 2: Understand how it supports your current business processes

Once a business understands how work is done, it needs to analyze how IT supports that work and business process. What IT assets are used to execute the business process? How well is the process integrated across process steps and applications?

Key players: Process owners, enterprise architects

Step 3: Understand how SOA can help

Now that the business understands how work is done and how IT supports that work, you must now look at how SOA can help improve your business process. What process tasks and decisions can be codified as SOA services?

Key players: Enterprise architects

Note: Steps 1 through 3 do not involve new technology yet. Rather, these steps are about understanding the current state and opportunities and building a roadmap to improving IT's support of the business process. Red Hat Consulting, along with partners, offer a wide range of SOA assessment services to help with these steps.

Learn more at www.redhat.com/consulting.

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Implement

Step 4: SOA design and determination

Once you've built a roadmap that describes how SOA can help IT improve business execution, it's time to turn to technical solutions. First, IT needs to determine how it is going to build and host SOA services, be they application or data services. How are SOA services going to be implemented (with Java EE or .NET, by reusing existing applications and publishing web services)? This information will help you determine the best technologies to use in your development and runtime environments.

Key players: Enterprise architects, developers

Red Hat offers **JBoss Enterprise Application Platform** for application logic services, **JBoss Enterprise BRMS** for business rules services, and **JBoss Enterprise Data Services Platform** for data services.

Step 5: SOA integration

Once IT has decided what SOA services technologies to use, the architects and development team working with operations need to decide how they are going to integrate these new and existing SOA services and applications such that they can be applied more efficiently to execute the business process.

Key players: Enterprise architects, developers

JBoss Enterprise SOA Platform is a next-generation ESB that enables this integration. **JBoss Enterprise Portal Platform** facilitates personalized interaction with the automated business process, improving the productivity of process participants.

Step 6: Business process management (BPM) and workflow

In this final step, the business and IT look to bring the SOA to life. Business process management and workflow technologies such as **JBoss jBPM** or **business process execution language (BPEL)** codify the automated business process.

Key players: Enterprise architects

Note: Red Hat Consulting has SOA, BRMS, and other implementation services that can quickly and efficiently help you accomplish steps 4-6.

Learn more at www.redhat.com/consulting.

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JBoss Enterprise SOA Platform



JBoss Enterprise SOA Platform includes service-oriented architecture (SOA) open source middleware, such as JBoss Enterprise Service Bus (ESB), JBoss jBPM, JBoss Rules, and JBoss Enterprise Application Platform, to integrate applications, services, transactions, and business components into automated business processes.

What does it do?

JBoss Enterprise SOA Platform enables enterprises to integrate services, handle business events, and automate business processes more efficiently – linking IT resources, data, services, and applications across the value chain. Unlike other offerings, the open source components can be used individually, together, or with third-party components to better suit evolving development needs.

Why should I care?

JBoss Enterprise SOA Platform provides the integration and SOA fabric to build enterprise SOAs that allow businesses to gain competitive advantage. By allowing a business to automate business processes, facilitate human participation in business processes, and connect the full value chain, JBoss Enterprise SOA Platform enables enterprises to optimize business performance.

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Overview

Many IT organizations look to achieve a competitive advantage for the enterprise by improving business productivity and reducing costs. Today's top enterprises are realizing this goal by deploying departmental, functional-area, and enterprise-wide ESBs, business process integration and automation systems, and SOA integration platforms within their IT infrastructures. While many of today's packaged ESBs, process servers, and business process management (BPM) systems help enterprises deploy SOA to improve business process execution, only JBoss Enterprise SOA Platform can deliver the benefits of a no-license-fee, subscription-based solution built on a flexible and scalable underlying platform.

Because it is deployed on JBoss Enterprise Application Platform – the industry's number one J2EE-certified application platform – access to dynamic information is made easy, and performance and scalability are assured. Choose JBoss Enterprise SOA Platform, whether you require a departmental SOA and business process integration solution or an enterprise-class SOA business process automation platform for the full range of value chain integration challenges.

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Benefits

- **Eliminate manual pain points from your business processes.**

Many business processes involve unnecessary manual intervention to move data or make calculations that could easily be automated by computers. However, the data semantics have not been reconciled across applications, or business logic has not been written down and codified, often resulting in the need for people involved in a business process who are not doing value-added work. This work creates pain points or points of potential failure in a business process.

JBoss Enterprise SOA Platform relieves these business process manual pain points by providing the simple, open, and affordable integration and business process automation platform to deal with data semantic transformation and integration of business logic across the enterprise.

- **Reduce business process execution error.**

Eliminating unnecessary manual intervention within business processes also reduces the opportunities for error. With JBoss Enterprise SOA Platform, routine data messaging, transformation, and routing tasks are automated, eliminating human error and reducing costs associated with unnecessary human error. Additionally, since JBoss Enterprise SOA Platform can leverage business logic or services hosted in a wide variety of environments, business processes can share logic, giving all requests the same answer for the same inputs using the same logic implementation. This eliminates cumulative error introduced into a business process as a result of using multiple algorithms and implementations for the same business logic.

- **Create better customer experiences leading to higher customer satisfaction.**

With the unnecessary manual pain points removed, processes integrated, and fewer errors, an enterprise creates better customer experiences by delivering service, support, product, and answers faster and with higher quality. JBoss Enterprise SOA Platform brings together IT assets – data, business logic, and business services – to enable business processes to better serve customers.

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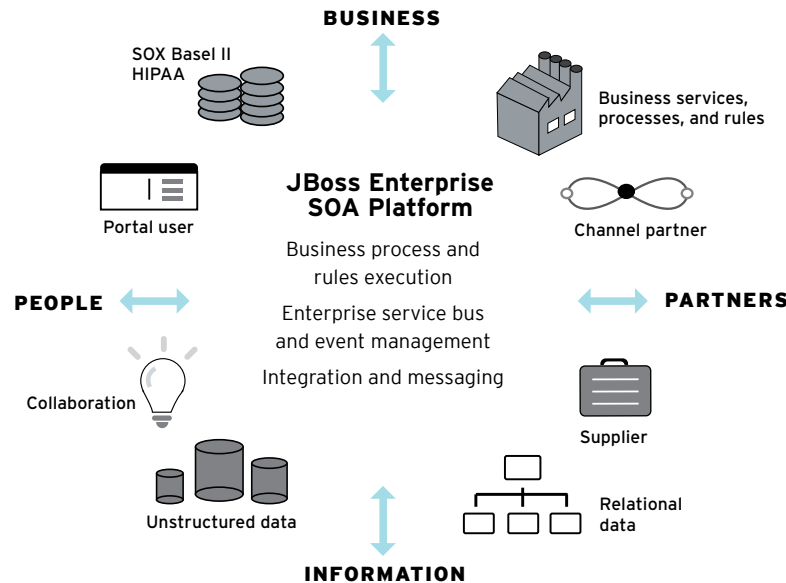


• **Accelerate business execution and improve business performance.**

JBoss Enterprise SOA Platform integrates services, business logic, and data, making these IT assets available to business processes. With business process workflow and rules capability, JBoss Enterprise SOA Platform enables IT and the line of business to automate the workflows and rules that drive the business processes and work of the organization. This automation, reduced error, and human task management provided by JBoss Enterprise SOA Platform drives faster business process execution and better business performance, increasing business agility and delivering better ROI.

• **Increase return on existing IT investment.**

Enterprises and value chains have a myriad of data, business logic, and business process resources already deployed across the IT organizations and in the line of business. JBoss Enterprise SOA Platform enables these IT and business assets to be used to support all appropriate business processes, increasing return on these IT investments.



Put simply, JBoss Enterprise SOA Platform allows you to leverage your existing infrastructural investments in software, hardware, and manpower.

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- **Trust enterprise-class reliability and scalability.**

JBoss Enterprise SOA Platform shields users from service disruptions by leveraging JBoss Enterprise Application Platform as its proven foundation for 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.

- **Automate business execution.**

Automated business execution requires that your IT infrastructure can handle business events, (e.g. integrate data, SOA services, and business logic within applications), and incorporate value-added human interaction (e.g., content creation and decision-making) into the process. This automation provides competitive advantage and, with well-defined services and an open integration platform, the ability to be flexible and responsive. Businesses that modernize their IT assets in this manner see higher customer satisfaction, lower costs, and greater financial returns.

JBoss Enterprise SOA Platform enables automated business execution by delivering a next-generation, open source, standards-based SOA platform that brings together all enterprise stakeholders and IT assets required to run the business.

In addition to SOA, this new architecture supports event management and event-driven architecture (EDA) deployments. With a rules engine utilized both within the ESB as well as available to business processes, JBoss Enterprise SOA Platform provides a foundation to support complex event processing (CEP) in the future. The workflow capabilities of JBoss jBPM are available both within the ESB to facilitate service and event orchestration as well as to process developers to automate business processes. JBoss Enterprise SOA Platform brings together leading open source technologies to deliver superior business execution that is simple, open, and affordable.

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Features and components

- **JBoss Enterprise Service Bus (ESB)**

JBoss ESB intermediates interactions between enterprise applications, business services, business components, and middleware to integrate and enable automation of business processes. JBoss ESB supports various messaging products for transport, component models as SOA endpoints, and data transformation for seamless communication. JBoss ESB provides a registry for service discovery and integration. JBoss ESB is designed to enable simple to advanced governance software from the open source community and commercial software vendors. Due to its flexible and open architecture, JBoss ESB allows partner products to plug in to supplement and extend JBoss Enterprise SOA platform.

- **JBoss Rules**

JBoss Rules is a fast and highly efficient rules engine that makes it easy for a developer to modify your business rules in your IT application infrastructure to implement evolving business policies. JBoss Rules also supports a variety of language and decision table inputs, making it easy to quickly modify your business policies to respond to opportunities and competitive threats.

- **JBoss jBPM**

JBoss jBPM enables enterprises to create and automate business processes that coordinate people, applications, and services. Designed for use within applications as well as supporting enterprise-scale applications, JBoss jBPM brings process automation to a much wider set of business problems ranging from embedded workflow to enterprise business process orchestration. When coupled with JBoss ESB and JBoss Rules, it enables business processes to leverage SOA deployments more simply, openly, and affordably.

- **JBoss Enterprise Application Platform**

By leveraging JBoss Enterprise Application Platform features such as Java EE services, robust clustering, and the Java Connector Architecture (JCA), JBoss Enterprise SOA Platform builds upon an enterprise-class foundation, enabling it to solve business automation, enterprise application integration, SOA integration, and process orchestration challenges found in business value chains worldwide.

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with JBoss Enterprise Middleware

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SOA case study: Support for mission-critical applications

Customer: Sparbank

Industry: Banking

Geography: Denmark

Business challenge: For legal compliance reasons, SPARBANK must ensure high availability of mission-critical applications. The bank also required access to professional support and services for its application platform.

Solution: JBoss Enterprise Application Platform, JBoss Enterprise SOA Platform, JBoss Enterprise Service Bus

Migration path: JBoss Community project to JBoss Enterprise Middleware

Benefits: Guaranteed high availability and greater flexibility of SPARBANK's mission-critical application platform

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BACKGROUND

SPARBANK, listed on the Copenhagen Stock Exchange, has served both consumers and businesses since 1857 and is a leading retail bank in Denmark with 22 branch offices across the country. The Danish retail banking market is very competitive with several active market players. SPARBANK offers personalised services to its customers, combined with competitive pricing and, above all, trust. In 2009, the bank had revenues of 964 million Danish crowns or approximately 129 million EUR (based on exchange rate on 28 September 2010).

BUSINESS CHALLENGE

In today's digital era, SPARBANK relies on its IT infrastructure to deliver applications and services that enable the bank to fulfill its commitment to its customers. Some applications are used by the bank's staff, while others are external services offered directly to customers. IT infrastructure is mission-critical to any modern bank like SPARBANK and applications need to perform with zero downtime. SPARBANK also must be compliant with a number of legal and other regulatory frameworks, which encompass IT systems and require the IT department to demonstrate how it ensures the availability of mission-critical applications.

SPARBANK's internal team develops Java applications for use throughout the bank's IT systems. Initially established to build applications not available in the marketplace, the team has developed tailored applications, which have become increasingly mission-critical over the years. This means the development team is frequently audited to ensure that the applications meet the requirements of regulatory frameworks. Business rules also require the development team create documents attached to each application, which detail the planned response to potential system problems. To stay compliant with business rules and ensure smooth operation of mission-critical applications, the development team at SPARBANK also needed access to professional support and services for its application platform.

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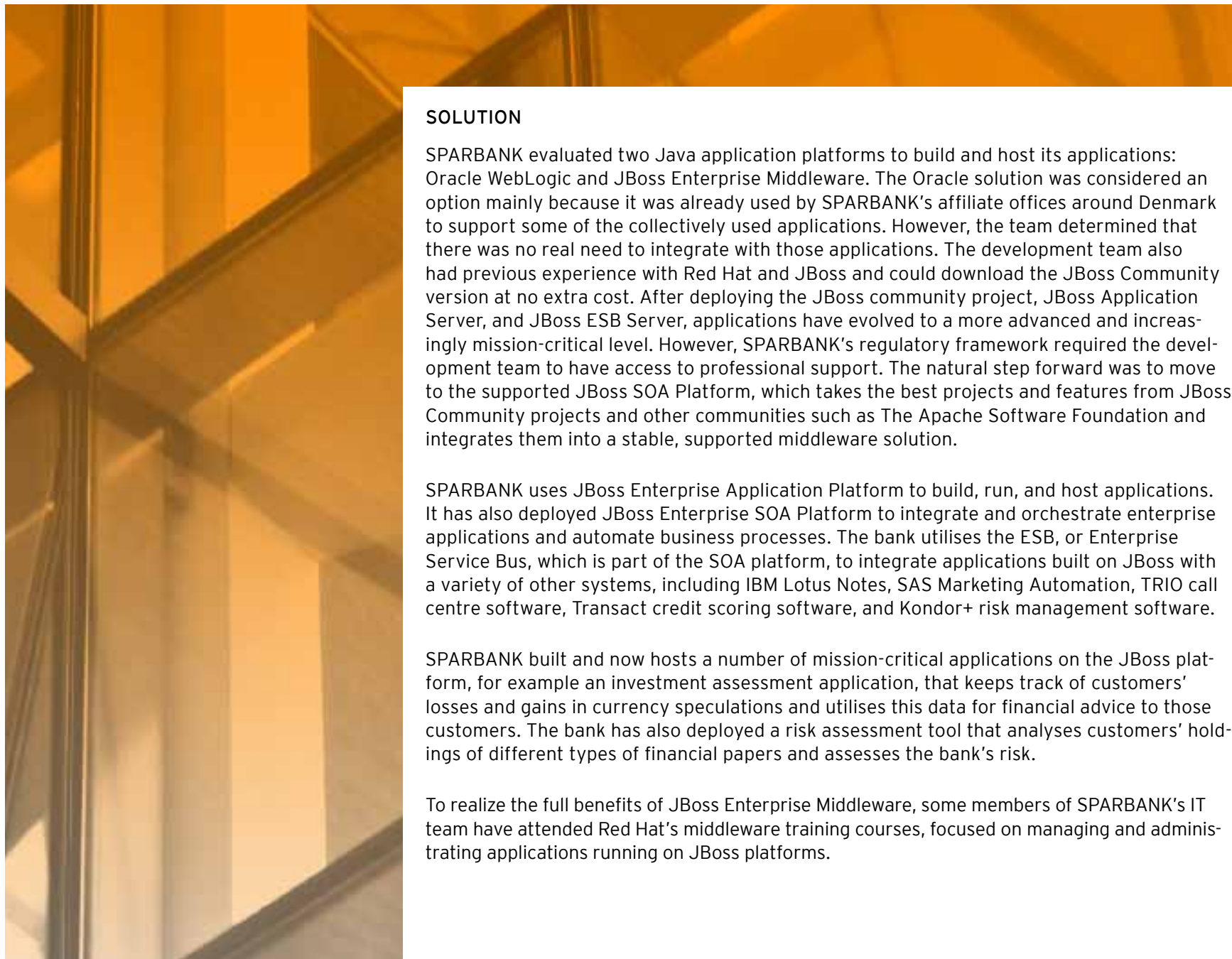
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SOLUTION

SPARBANK evaluated two Java application platforms to build and host its applications: Oracle WebLogic and JBoss Enterprise Middleware. The Oracle solution was considered an option mainly because it was already used by SPARBANK's affiliate offices around Denmark to support some of the collectively used applications. However, the team determined that there was no real need to integrate with those applications. The development team also had previous experience with Red Hat and JBoss and could download the JBoss Community version at no extra cost. After deploying the JBoss community project, JBoss Application Server, and JBoss ESB Server, applications have evolved to a more advanced and increasingly mission-critical level. However, SPARBANK's regulatory framework required the development team to have access to professional support. The natural step forward was to move to the supported JBoss SOA Platform, which takes the best projects and features from JBoss Community projects and other communities such as The Apache Software Foundation and integrates them into a stable, supported middleware solution.

SPARBANK uses JBoss Enterprise Application Platform to build, run, and host applications. It has also deployed JBoss Enterprise SOA Platform to integrate and orchestrate enterprise applications and automate business processes. The bank utilises the ESB, or Enterprise Service Bus, which is part of the SOA platform, to integrate applications built on JBoss with a variety of other systems, including IBM Lotus Notes, SAS Marketing Automation, TRIO call centre software, Transact credit scoring software, and Kondor+ risk management software.

SPARBANK built and now hosts a number of mission-critical applications on the JBoss platform, for example an investment assessment application, that keeps track of customers' losses and gains in currency speculations and utilises this data for financial advice to those customers. The bank has also deployed a risk assessment tool that analyses customers' holdings of different types of financial papers and assesses the bank's risk.

To realize the full benefits of JBoss Enterprise Middleware, some members of SPARBANK's IT team have attended Red Hat's middleware training courses, focused on managing and administering applications running on JBoss platforms.

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BENEFITS

By migrating to JBoss Enterprise Middleware, SPARBANK receives access to professional services and support, thereby ensuring compliance with both internal and external business rules, including guaranteeing high availability of the applications developed and running on JBoss environments.

Migrating from the community projects available on JBoss.org to fully supported and tested JBoss Enterprise Middleware platforms took just a few weeks. "We did not experience any issues when migrating to the enterprise version of the JBoss platform. It would have gone even faster if we had not decided to cluster the platform and run it on several virtual servers simultaneously in order to ensure high availability. This decision has enhanced the flexibility of our platform as it enables us to do maintenance work on applications anytime, also for example during working hours, something which we were not able to do before," said Kenneth Larsen.

One of the most important aspects of solving potential system problems is response time. Red Hat support services provide SPARBANK with fast response and relevant information. "We save time and manpower by relying on Red Hat middleware support services. If a problem occurs, we can count on their quick feedback to our questions, which means we can resolve any issues before they cause real damage. We also use support services on a regular basis to consult them on best practices on a wide range of areas that would previously take weeks, months, or even longer to research through other channels," Larsen continued.

Since migrating to JBoss Enterprise Middleware, SPARBANK has not experienced any unplanned downtime of any application. The development team has also expanded its knowledge on the JBoss product suite and can use JBoss platforms more efficiently by utilising new relevant functionalities and features.

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“Running mission-critical applications in a bank requires a supported platform. JBoss Enterprise Middleware suite from Red Hat offers access to a complete set of services, including industry-leading technical support, certified patches and updates, long-term maintenance policies, and software assurance. Therefore it was a natural choice to migrate from the unsupported JBoss Community project to the JBoss Enterprise Middleware platform.”

-Kenneth Larsen, development team at SPARBANK

FUTURE

SPARBANK will continue to deploy new applications on JBoss Enterprise Application Platform and use JBoss Enterprise SOA Platform to integrate them with other systems and therefore maintain a Service Oriented Architecture that makes efficient use of each service and improves business process execution speed and quality.

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BUILDING YOUR CLOUD

Q&A with Craig Muzilla

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Service-oriented architecture (SOA) is being used across many enterprises today, but implementation strategies are extremely varied. For examples of how it's being used well, BTQ talks with Craig Muzilla, Vice President of JBoss Enterprise Middleware at Red Hat, Inc.

Craig Muzilla is responsible for Red Hat's overall middleware and JBoss product business. Mr. Muzilla provided leadership establishing early web services industry initiatives and has led strategy, product management, marketing and business development for many middleware software companies. Prior to Red Hat, he was Senior Vice President at MetaMatrix, a leader in data services middleware that was acquired by Red Hat.

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BTQ: *To frame our discussion a bit, what is your definition of SOA?*

CRAIG MUZILLA: SOA is a new modern architectural approach for building and integrating applications. Essentially, it provides a great degree of flexibility in how one can create applications. SOA is much easier and simpler than the traditional means for creating applications, and much more dynamic. It's based on a concept called abstraction. What abstraction means is that we will create services that are really business processes – it could be taking an order or looking up a customer profile – and we're hiding the underlining implementation of how that code's written. [The code] could be written a number of different ways, but as long as the interface is abstracting the implementation, it makes it much easier to use that business process and can be reused over and over. Also, if the implementation changes, it won't break the application, making it much more dynamic for putting together applications and integrating processes across an organization or even across boundaries.

BTQ: *Some of the things you discussed, such as the reuse aspect, seem like they could be important to enterprise IT. Can you touch on that? In other words, what is SOA's value proposition?*

CRAIG MUZILLA: There are quite a few benefits to SOA. First, it provides a high degree of interoperability between business processes and applications. It makes it much easier to integrate things together. For instance, a company might have a financial system, customer relations management system, and suppliers. SOA makes it much easier to tie all those systems, together and... respond to business changes. So, if there's a new process that needs to be incorporated into an application, or a new workflow, such as a new way of doing claims processing, it's very easy to make those changes. With traditional software, you'd have to rip the software out or rewrite the code, which is very difficult to do. SOA also allows a company to integrate a number of diverse systems, like web-based applications that may have been written in the Java language or older systems that were written on a mainframe. SOA makes it much easier to

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bring those [systems] together. Finally, there is a lot of reuse of processes and more consistencies. For instance, defining what a customer is for a company. In the past, if you had three or four different applications, customer data was replicated across these three or four applications. Now you can create a customer service used across all your applications, reducing the cost of having to maintain the customer data while providing a great level of consistency.

BTQ: *Can you discuss Red Hat's version of SOA and its strategy, as well as where enterprise middleware (software) comes in?*

CRAIG MUZILLA: Red Hat is an open source infrastructure software company. We provide operating system software in the form of Linux, virtualization software, and middleware software, which is part of our JBoss brand. Our strategy as it relates to SOA is to provide a whole portfolio of middleware products that help companies implement SOA.

We provide middleware products that help you build these types of applications, and to deploy, run, integrate, and manage them. Among the types of products that we offer, we have a world class application server and platform, development tools, an enterprise service bus, which is some of the fundamental plumbing in our SOA environment, business process management software and software for creating Web 2.0 applications. All of these are provided to help a company implement an SOA-based approach to how they're developing and integrating their applications.

BTQ: *How does SOA help companies with cloud computing?*

CRAIG MUZILLA: One could easily argue that in many ways, cloud computing isn't possible without SOA. Through SOA, one can more readily move business processes into the cloud and more readily use these processes. No longer do all of your processes need to be run and owned locally into siloed applications. For example, SOA makes it possible for SaaS providers to offer business services

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that can be integrated with a company's own processes. These external services could be things such as logistics tracking, tax calculations, currency exchange and many more.

By service-enabling these processes, companies don't need to write their own code – they can leverage these services into composite applications. Also, companies can more readily create a business process and push it into the cloud for greater utilization, but through SOA, still make it possible to access the process regardless of its location.

Red Hat's JBoss products, such as our application platforms, enterprise service bus, and business process management software, make it easy to service processes for the cloud. JBoss can help a company utilize external cloud-based services and then orchestrate a collection of cloud services into a comprehensive business application or set of processes.

BTQ: *What is unique about Red Hat's approach?*

CRAIG MUZILLA:

Probably the most unique thing about our approach is that everything is open source. Open source software means that when we deliver a product to a customer, they not only have the binary code, but they also have the source code and can see everything that is going on underneath the covers. Everything is built in a community process, so if customers want to contribute code, they can do so. They can also see what's coming down the road in terms of new products that are being developed. The approach we've taken with the JBoss portfolio is that since products have all been developed in the community, and we've helped drive the community, everything works together.

When companies implement SOA, using middleware pieces to do that, they may have different pieces (of software) even within the same company and often these pieces don't work together smoothly. We've architected everything to work together well and we're the only vendor in the marketplace that's providing all the pieces under an open source model. What does open source really

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provide to a business? There's a lot of transparency and flexibility, especially in an SOA environment, and fundamentally, it's a much more cost effective way to not only do the development, but also run these applications over time.

BTQ: *Could you give an example where a company is using your version of SOA well?*

CRAIG MUZILLA: Let me give you a couple of examples. The first one is a customer in Europe. The Swedish railroad has implemented many of our products within the JBoss portfolio for an SOA-based application. They were trying to develop a more flexible software delivery system in their company and their first application implemented was a ticket auctioning system. Often the railroad will have an excess of tickets during the day, seats that go unfilled. What they wanted to do was be able to post those tickets on a subsidiary of eBay and sell them to the highest bidder so they could fully sell the seats. This required a level of interoperability between the outside provider that would be hosting these tickets and the Swedish railroad themselves. Using a traditional means of development for this would have been very complex, very costly, and very brittle.

If anything would have changed, it would have broken the application. Using an SOA-based approach, and JBoss products from Red Hat, the Swedish railroad was very easily able to implement this ticket auctioning system, integrate with the eBay subsidiary to sell the tickets, and they did it in four months rather than the estimated twelve months it would have taken with traditional means. They were also able to get a very fast return on investment (ROI) and sell an additional 2,000 tickets a week.

The second example is a company called Toronto Hydro, a utility company based in Toronto, Canada. They were implementing an SOA-based approach for all their systems. One of the first applications was something called a Smart Meter system. They needed a way... to tie their SAP system and Oracle financial system together and supply information about the electricity being used by a consumer so (the data) could be introduced to a variable-based pricing

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model... Since these systems would often change, and some of the underlying implementation would therefore change, SOA was the best way to go. Toronto Hydro used the JBoss products to tie the systems together and then offered this Smart Meter system to their consumers.

BTQ: *For both of these implementations, it sounds like there were some major changes that were taking place during the switch to SOA and the JBoss suite. What were some of the pain points experienced and how were they solved?*

CRAIG MUZILLA: Using a more traditional approach, it would have been very difficult to have the level of integration of the various processes, both inside and outside these two companies. By using an SOA-based approach and the JBoss product line, it was easy to create service interfaces for all these business processes, couple them together and... (make it) easy for developers to implement and use. It saved a considerable amount of time.

At the end of their projects, once they had these two applications up and running, the companies can now be much more flexible. If there was anything they needed to change, such as the underlying implementation, they can make those changes without breaking the application and they can diagnose any issues because of the open source nature of the JBoss product line. Their interface with the JBoss community and through Red Hat also allows the companies to offer suggestions for changes to new software releases and new projects.

BTQ: *What were some of the benefits that companies gained from making this change to SOA and JBoss products?*

CRAIG MUZILLA: It was a faster time to implement under both scenarios. In general, using JBoss and the concept of SOA makes it faster to implement rather than having to hard code products together. Because they were faster, their time to ROI was much faster. One of the big benefits, coming back to flexibility, was that if any of these processes need to change in the future, companies can make these changes to

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applications easily without having to rewrite the initial implementation. No business is static, they are always changing... and because of the JBoss product line and SOA, a company can be much more agile. They'll be able to change these applications as they gain more experience with their customers or as market conditions change. It becomes a much more dynamic way of executing these two capabilities.

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