



# BOOZ ALLEN DELIVERS A FLEXIBLE AND SCALABLE SOA SOLUTION TO CLIENT BY LEVERAGING RED HAT PRODUCTS

## FAST FACTS

Company	Booz Allen Hamilton	Booz   Allen   Hamilton
Industry	Management Consulting	
Geography	McLean, Virginia	
Challenge	Build a service oriented architecture (SOA) solution for a government client that could be leveraged and reused for other client engagements	
Migration Path	Transitioned a custom coded, proprietary-based solution to a a hybrid COTS/GOTS/Open-Source application that leveraged a significant portion of the Red Hat product portfolio.	
Software	JBoss Enterprise Application Platform, JBoss Enterprise SOA Platform including JBoss jBPM and JBoss Rules, JBoss Operations Network, Red Hat Enterprise Linux Advanced Platform with Xen virtualization, Red Hat Cluster Suite and Red Hat GFS.	
Operating System	Red Hat Enterprise Linux 5 Advanced Platform	
Hardware	Eight Dell 2950 servers with 32 gigabytes of memory	
Benefits	Booz Allen built a modular SOA environment that efficiently supported the development and integration of new applications into the system, reducing the dependence on custom coding when doing proof-of-concept or production deployments of client systems across a broad range of government and commercial applications	

## BACKGROUND

Booz Allen Hamilton has been at the forefront of strategy and technology consulting for more than 90 years. Every day, government agencies, institutions, and infrastructure organizations rely on the firm's expertise and objectivity, and on the combined capabilities and dedication of our exceptional people to find solutions and seize opportunities. Providing a broad range of services in strategy, operations, organization and change, information technology, systems engineering, and program management, Booz Allen is committed to delivering results that endure. With 20,000 people, Booz Allen generates approximately \$4.0 billion in annual revenue.

## CHALLENGE

In 2004, Booz Allen was approached by a government agency to perform a proof of concept for a proprietary-based document-processing system. Although the proof of concept was successful, attempts to scale the solution up to a production-grade system encountered serious roadblocks. "We went into it carrying a lot of 'baggage' due to short-cuts we'd made in the prototype system because of the lack of time and the resources we'd had during the proof of concept," said Christopher Dale, an associate with Booz Allen Hamilton. Over the next year and a half as more users were added, the team "spent a great deal of effort trying to deal with that baggage," Christopher said. "But the system simply couldn't scale the way we needed it to."

When the agency secured funding to take the system to a new level of capability, the Booz Allen team knew it had to completely rethink its options. From the start, Christopher believed that open source was the answer, and virtualization clearly needed to be part of the solution. Additionally, "we knew we needed a clustered file system, as the old way of moving data back and forth was a real bottleneck," said Isaac Christoffersen, an associate at Booz Allen Hamilton. There also had to be a lot more flexibility for dealing with changing customer requests for additional functionality as well as scalability.

#### SOLUTION

After thinking through its options, Booz Allen decided to design a service oriented architecture (SOA)-based cloud platform using an enterprise service bus (ESB) for a variety of reasons. First, a highly clustered and highly virtualized architecture was needed to build the kind of agile grid of computing and storage resources necessary to scale to the extent the client agency needed. Additionally, Booz Hamilton wanted to build a platform it could leverage in the future for other client engagements.

The physical layer of the architecture was made up of the computers, storage-area networks (SANs), Ethernet networks and Fibre Channel switches. Booz Allen used commodity hardware to build this layer out. The foundation layer of the architecture created a physical "resource pool" for the system to utilize at the virtualization layer, where server, network, and storage resources could be more efficiently leveraged. Booz Allen also used Xen virtualization and the Red Hat Global File System (GFS) on top of Red Hat Cluster Suite to create an environment for transaction processing. Red Hat's Conga Cluster Management capability, a component of Red Hat Enterprise Linux Advanced Platform, was used to control cluster and storage management.

At the application layer, JBoss Application Server provided the ability to create a clustered application server environment. Its built-in redundancy allowed Booz Allen to implement a message-driven Message Oriented Middleware (MOM) infrastructure using the JBoss Enterprise SOA Platform that included JBoss Enterprise Service Bus (ESB), JBoss jBPM and JBoss Rules. JBoss Operations Network was used to perform application and service management.

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- Christopher Dale,  
associate,

Booz Allen Hamilton.

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## BENEFITS

The Red Hat-based implementation provided the agency with a multitude of benefits. For starters, it was able to consolidate 55 underutilized servers into just eight servers. This reduced number of systems not only handled the existing processing load, but left capacity available for even more growth in the future.

The system also helped Booz Allen design a system with tremendous flexibility and scalability. Using Red Hat solutions, Booz Allen was able to help the government agency adapt to changes in its mission and system demand in a more agile manner. Over a one-year period, data processing has increased from 1,000 documents per hour and 18,000 documents per day to more than 10,000 documents per hour and 100,000 documents per day. The number of users increased 600 percent in the first year that the system was implemented.

Believing that Booz Allen could leverage what the team had designed for other client engagements, the team briefed a group of Booz Allen partners on the idea... and they agreed. These partners agreed to fund a new initiative that is taking the SOA groundwork that the team created for the federal government, and using it to build a more general platform for application prototyping, development, and production for other government clients.

The current configuration of this platform offers database as a service, storage as a service, network as a service, and hardware as a service. The concepts in this SOA are those that industry leaders such as IBM and Amazon have been promising to deliver at some point in the future, Christopher said. "But we're able to deliver it now." Among other things, SOA has greatly improved our ability to

integrate commercial and government off the shelf (COTS/GOTS) products. Historically, around 50% of Booz Allen's development efforts were related to writing custom software to enable the integration of COTS and GOTS. By selecting solutions that leverage commercial and open standards, Booz Allen's SOA approach reduces the need for this custom software and helps their clients achieve better reuse within their enterprise. Going forward, this new platform promises to be absolutely mission-critical to the way Booz Allen will provide its technology consulting services.

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