

IBM SOA Appliances
Redefining the Boundaries of Middleware

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Executive Summary

In today's competitive business environment, innovation drives success and growth. Speeding the go-to-market time of enterprise innovations is critical for increasing business agility. Applications and supporting infrastructures must be built to change, built to last, and built to run 24x7. Businesses are constantly challenged to share and transmit highly-sensitive data securely, and with increasing speed. Service-oriented architecture (SOA) improves business resilience by enabling both the rapid reuse of existing assets and the sharing of services and infrastructure across the business. However, the strategies for adopting an SOA approach can be confusing, if not daunting. Additionally, incorporating SOA's Web services and XML-based underpinnings with a multitude of new connectivity points can introduce a host of issues for any business, including complexity, security, and slow performance. If not addressed, these issues can be prohibitively costly in terms of resources, time, budget and risk. For enterprises to reap the benefits of SOA deployments, they must find ways to address these risks.

The emergence of SOA appliances has shifted the SOA paradigm. As hardened, specialized hardware, SOA appliances simplify, help secure, and accelerate your XML and Web services deployments, extending your current investments and speeding the return on your SOA investment. These appliances offer an innovative, pragmatic approach to harness the power and potential of SOA while simultaneously enabling you to leverage the value of your existing application, security, and networking infrastructure investments.

1 Trends in Connectivity

Today's business world is an increasingly complicated matrix of any-to-any connectivity points. Indeed, connectivity between applications is what powers your business. While Web Services and XML have resolved the issue of standard connectivity, they do not inherently simplify the complex maze of point-to-point connections found in today's enterprises (see Figure 1 for a real-world example.) With XML and Web Services laying the foundation for many approaches to SOA, the new problems they introduce include security, scalability, performance, and the manageability of this new generation of heterogeneous connections.

Funding managers looking to streamline environments such as the one depicted in Figure 1 have been bitten before by the promises of application consolidation, virtualization, distributed networks, etc. So the last thing you need is an SOA investment that looks like yet another long-term maintenance project requiring specialized – and expensive – skills, resources, exposed risk and little pay back. Getting a fast return on your SOA investment is critical, as is the ability to reduce the need for and cost of in-house SOA skills as demand for those skills skyrockets.

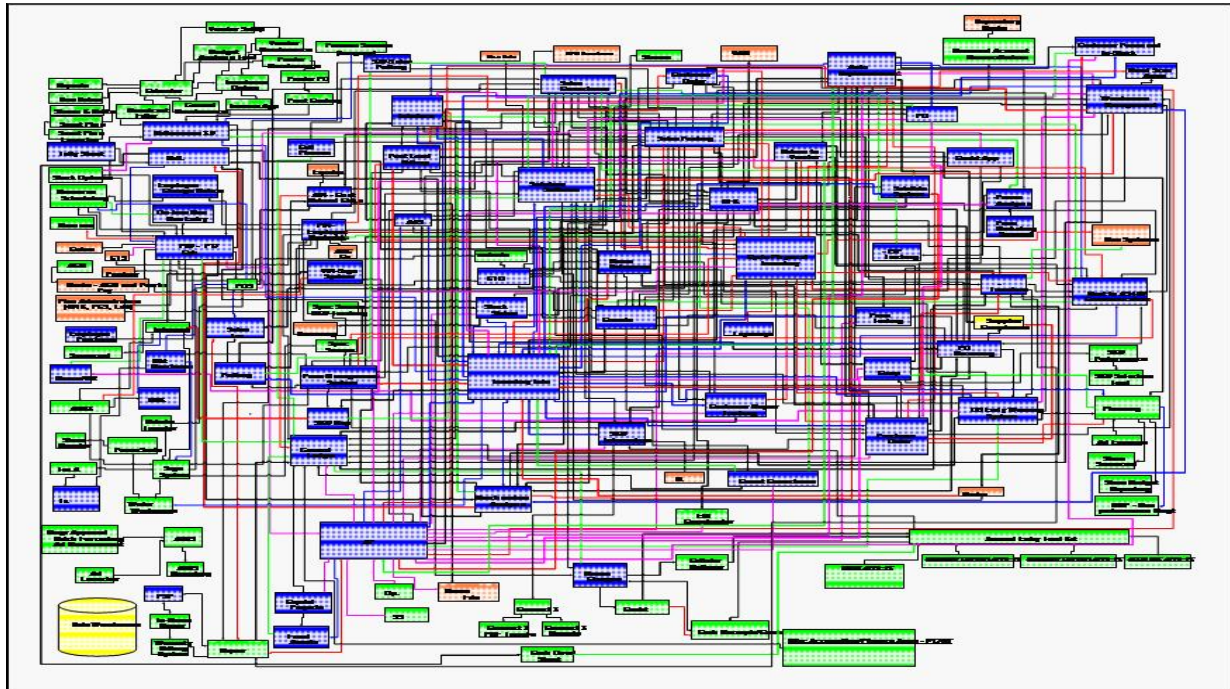


Figure 1 - Actual application topology for a company

These trends are forcing organizations to find simplified ways to adapt, scale, and innovate without shouldering costly, and unnecessary, re-architecting burdens. SOA can truly align business and IT priorities, loosening – even breaking – the tightly-coupled connections between applications, data and services, thus allowing broad connectivity across the enterprise. SOA appliances are instrumental in creating streamlined, scalable, and secure connectivity that reuses and integrates services, data, and business processes across the enterprise, and beyond to partners, suppliers, or customers.

2 Game-changing Innovation

When Apple introduced the iPod, the way people gathered, organized, shared, and listened to music was changed forever. The iPod put the listening experience in the hands of the listener like never before, giving customers the ability to pick and choose songs they prefer, even specific versions of songs, and listen to them in any order they choose. Coupled with the iTunes service, the iPod also freed people from having to buy an entire CD to get one or two favorite songs, and it gave everyone a simple and very practical means for managing both the music they download, as well as the music they store from their own collections. Now iPod users can have entire music libraries at their fingertips, and they can completely customize the listening experience using a simple, purpose-built device.

It has long been possible to assemble the various hardware and software components to store music and save it onto a portable device in a customized way. Mix tapes were one way to do this, followed by home-grown mixes burned onto CDs. But even those had severe limitations of time, durability, and portability, by comparison to the iPod. Looking at the simplicity, affordability and scalability of the iPod, why bother trying to build all that from scratch? Apple has purpose-built a device that enables consumers to manage media currently owned as well as

integrating media downloads (music, as well as movies, TV shows, videos, photos, etc.) This purpose-built device allows consumers to connect media, songs and playlists easily.

3 Appliances Shift the SOA Paradigm

A similar game-changing shift is happening today within SOA. Although you can purchase or develop the separate infrastructure components for an effective SOA, those moving parts, sometimes disparate in purpose, can often lead to levels of complexity, risk, cost, and performance degradation that make constructing an SOA prohibitive or impractical. However, similar to the paradigm shift enabled by the iPod, specialized SOA appliances are now available that tightly integrate many SOA functions into a single, configurable, unifying device that can simplify, secure and accelerate your SOA.

3.1 What are SOA appliances?

SOA has evolved and matured via the increased standardization of messaging formats like XML, Web services standards like SOAP, WSDL and UDDI, and the ubiquity of messaging protocols like HTTP and MQ, and interoperability profiles. These advances, combined with deployment experiences across a wide variety of industries and government agencies, have catapulted the “information age” into territory that was unimaginable 20, 10 or even 5 years ago. On the other hand, these innovations have uncovered liabilities that did not exist when legacy information, systems and services were siloed: data security and transformation problems, access controls, scalability, processing speed, etc. SOA appliances are purpose-built to address these specific liabilities, providing solutions that are scalable, secure, and capable of transforming how organizations do business.

In 2005 IBM acquired DataPower, pioneers for scalable, secure XML processing since 1999. DataPower was the first company to create purpose-built network devices to perform XML processing, integrate application-specific integrated circuits (ASICs) into products designed to simplify, secure and scale XML processing, and implement a broad XML-aware and application-based networking strategy. By 2004, DataPower had introduced early versions of all three SOA appliances that now comprise the IBM SOA Appliance portfolio: the WebSphere DataPower XML Accelerator XA35, the WebSphere DataPower XML Security Gateway XS40, and, moving beyond the ability to process just XML, the WebSphere DataPower Integration Appliance XI50.

Innovations have continued since IBM announced its WebSphere DataPower SOA Appliance product line in early 2006. With significant ongoing investments in robust IBM hardware platforms, application interoperability, and standards, these devices remain purpose-built appliances from the ground up, using patented technology to maximize customer value through extreme SOA performance, simplicity and security. IBM SOA appliances redefine the boundaries of middleware, extending the SOA foundation with specialized, consumable, dedicated devices that combine superior performance and hardened security for SOA implementations. Embedding message processing and security directly into high performing, highly reliable and secure network hardware, DataPower SOA appliances allow businesses to route, transform, integrate and help secure applications without iterative code changes (see Figure 2.) This in turn lowers costs and complexity, and enables simplified scalability of mission-critical applications.

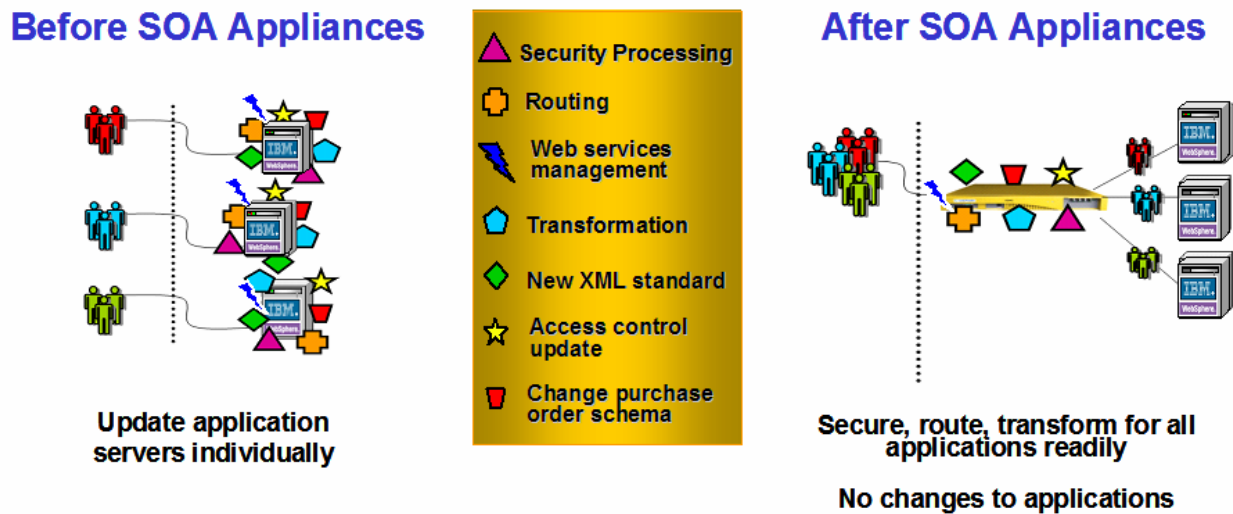


Figure 2 - SOA Appliances centralize and simplify critical, complex SOA Functions

3.2 Varied Deployment Scenarios for SOA Appliances

As businesses rely increasingly on SOA, Web Services and XML applications to bring innovation to the enterprise, there are numerous opportunities to take advantage of SOA appliances' integration functionality, security and acceleration capabilities (see Figure 3.)

3.2.1 Provide security and incoming access controls

As seen in point 1 of Figure 3, an SOA appliance can protect against incoming attacks via deployment as an XML firewall. Traditional security infrastructures were not designed to deal with the increasing number and variety of XML-based threats. Enterprises can use an SOA appliance as an enforcement point for XML and Web services interactions, validating XML schemas, providing encryption, performing firewall filtering and verifying digital signatures.

3.2.2 Provide outgoing access controls

Controlling access to high-value Web services is a key priority for enterprises deploying SOA. IBM SOA appliances offer a hardware enforcement point for XML access policies, providing a higher level of security and performance. These appliances inspect all incoming messages, perform authentication and authorization for each message, and reject and log invalid requests, to help ensure that only valid requests reach the backend systems. Instead of implementing access control in each XML application, IBM SOA appliances centralize access policy enforcement, providing a solution that is architecturally sound, cost effective, and easy to scale and manage.

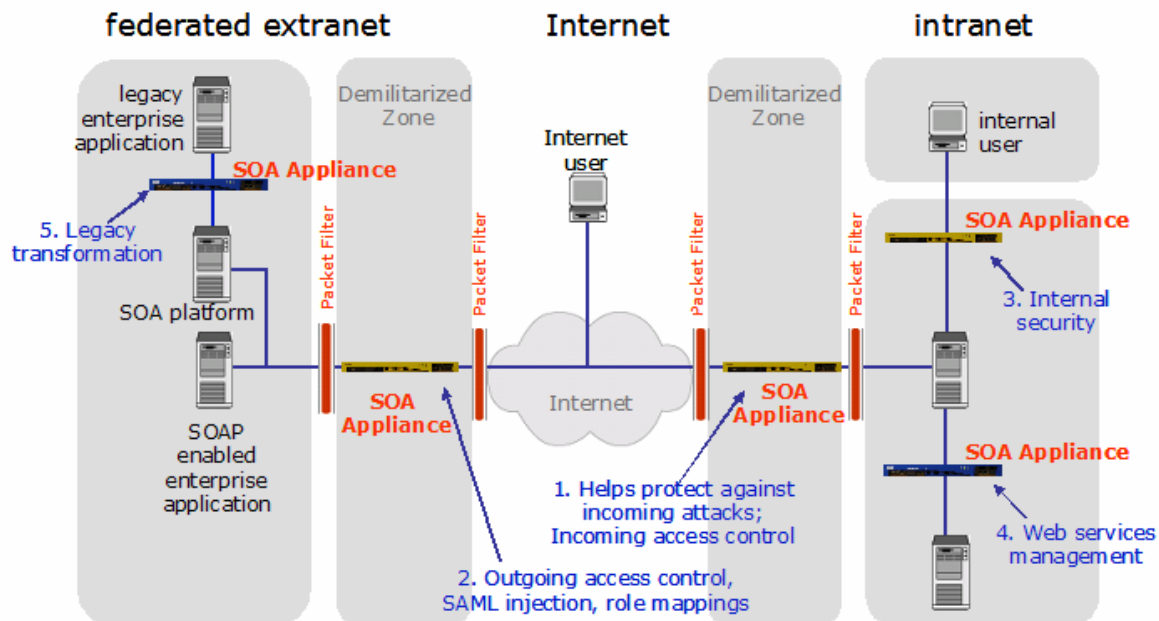


Figure 3 - Sample deployment scenarios for SOA Appliances

3.2.3 Enable Internal security via role-based security configurations

IBM SOA appliances help address broad organizational needs by allowing security controls to be placed within the appropriate group or department tied to the corresponding business need: enterprise architects, network operations, Web developers, identity management, security, etc. More importantly, with an IBM SOA appliance, these requirements can be configured inside a centrally-located tamper-proof hardware device, which is far more cost effective than coding the same controls across a variety of applications and servers.

3.2.4 Web Service and SOA policy management

Security Assertion Markup Language (SAML), WS-Security, WS-Trust and eXtensible Access Control Markup Language (XACML) are key standards for implementing access control and policy enforcement in an open, cross-platform environment that connects a variety of policy enforcement points (such as IBM SOA appliances) to central policy repositories. IBM SOA appliances offer comprehensive supports for evolving XML standards such as these, and even for non-standard, in-house policy implementations. IBM SOA appliances perform fine-grained authorization based on attributes such as roles, locations, functions, etc., as well as enable federated identity between multiple companies.

The growth of XML places greater importance upon the interdependence of the networking, SOA and application layers. By shouldering the burden of processing XML transactions securely and at wire-speed, IBM SOA appliances play a crucial role in expanding enterprise Web services scalably and efficiently.

3.2.5 *Web-service enable legacy systems for connecting into an SOA*

Fundamental to SOA is the ability to reuse existing systems and connect disparate data formats. These tasks can range from allowing legacy systems to communicate using common messaging protocols, to SOAP-enabling back-end systems in order to expand enterprises' capabilities and services, to mediation between external partner specifications and internal forms of the same information, to integrating services and processes across a heterogeneous environment.

In today's swiftly-changing business environment, enterprises cannot afford to become mired in an exhaustive process of properly and securely exposing legacy applications as Web services or SOA components. IBM SOA appliances perform such robust integration tasks as data transformation and protocol mediation, enforcement of security policies, and the monitoring of service-levels, as well as other tasks to effectively allow core business applications wherever they are hosted to be leveraged in an overall SOA. Additionally, IBM SOA appliances have no platform dependencies for their usage, and require no proprietary schemas, coding or APIs. With this drop-in, easily integrated solution, the IBM SOA appliances offer enterprises the ability to reuse existing assets and investments efficiently and scalably.

4 Success Factors for Value-driven SOA

In today's high-stakes business landscape, an enterprise is only as good as its ability to deliver timely, accurate, and secure services and information. Faster and trusted information expectations are being set – and raised – higher every day by your customers, business partners, competitors, and internal stakeholders. Finding the right SOA-enablement components and capabilities to deal with the growing complexities across a business can quickly turn an IT headache into an innovation opportunity.

IBM SOA appliances offer simplified, configurable network devices that are easy to deploy, provide built-in, hardened security, and operate at wire speed. Having the assurance of implementing a cost-effective, drop-in SOA appliance with such a robust feature set and shortened return on investment allow businesses to focus tasks, personnel and funds on other critical areas of their SOA. IBM SOA appliances help customers incrementally design, build, and deploy SOA at a comfortable pace mapped to their specific needs and goals. Meticulously designed to augment all phases of the SOA lifecycle and implementation, these highly-specialized devices combine a host of essential SOA functionality into a specialized appliance for easy consumption, deployment and service delivery.

5 Conclusion

In an era where innovation drives success and growth, many IT departments are spending as much as 80% of their budgets on maintenance.¹ The pressures to create real innovations with such a small share of the IT budget make enterprise architecture decisions even more critical. It is essential to remember that SOA is not about buying information technology – it’s about investing for business flexibility.²

In our increasingly global economy, a flexible enterprise is one that can innovate quickly, streamline business process management, improve system efficiency, and, most importantly, rapidly respond to constantly changing market conditions. Being a leader requires real-time information that is readily available and consumable for both today’s needs and tomorrow’s plans. Make no mistake, SOA brings a great deal of promise as well as potential complexities related to new interoperability, security, manageability and application-tier opportunities. The challenge is to adopt SOA without introducing additional complexity while actively providing flexibility, reduced complexity and leveraging your existing investments.

Just as the iPod simplified the way the world listens to, integrates, shares and manages music and other media, IBM SOA appliances are game-changing innovations for SOA. These SOA appliances present a flexible and agile option for your enterprise architecture – speeding the return on your investment, and making it easier to realize your own game-changing innovations by getting to the business benefits of SOA in less time, with less risk and lower cost.

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¹ <http://www.computerweekly.com/Articles/2007/04/19/223342/it-departments-spend-too-much-on-maintenance-says-analyst.htm>

² “Changing the Way Industries Work: The impacts of service-oriented architecture,” IBM Global Business Services. IBM Institute for Business Value Study. October 2006.
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