



Westbridge Technology
Critical Infrastructure for Services Oriented
Architectures (SOA)



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Executive Summary

Services Oriented Architecture (SOA) is beginning to revolutionize the way IT is structured. Over half of all companies are already moving to an SOA environment and Web Services is one of the key enabling standards. SOA enables organizations to respond to change better, faster, cheaper, and provides agility, flexibility and cost savings. Ultimately, SOA better aligns IT with business.

Westbridge Technology provides the XML Message Server (XMS) which provides XML Firewall and shared security services infrastructure for SOA environments. Through innovative Service View technology, the Westbridge XMS can create powerful, SOA Ready services that are

- highly secure
- fully interoperable with a multitude of standards
- provide all of the common infrastructure elements (such as security, monitoring, alerting, routing, etc.) without adding any additional code
- provide a framework for enforcing and centrally managing rules and contracts

Web Services does not equal SOA. What Westbridge does is take your Web Services and provides security, context and relevance to your services so that your Web Services are more reusable, more secure and more robust and better aligned to your business functions.

Westbridge not only makes your services SOA Ready, but also provides significant cost savings, dramatically reduces the time to production and reduces operational and security risk for your XML and Web Services projects.

What is SOA?

Services-Oriented Architectures (SOA) is an often used term in today's IT organizations. Some surveys have shown that half of all Fortune 500 companies are actively pursuing an SOA in some form or another, many instituting it as their fundamental design concept. SOA is not something that you can simply buy off the shelf, but rather is a process and architectural mindset that enables a type of IT structure to be put in place. The SOA design approach focuses on organizing business systems as reusable components, not fixed processes. It requires coordination with potentially many parts of the organization and is a continuous process that changes the way IT technologies are developed and used.

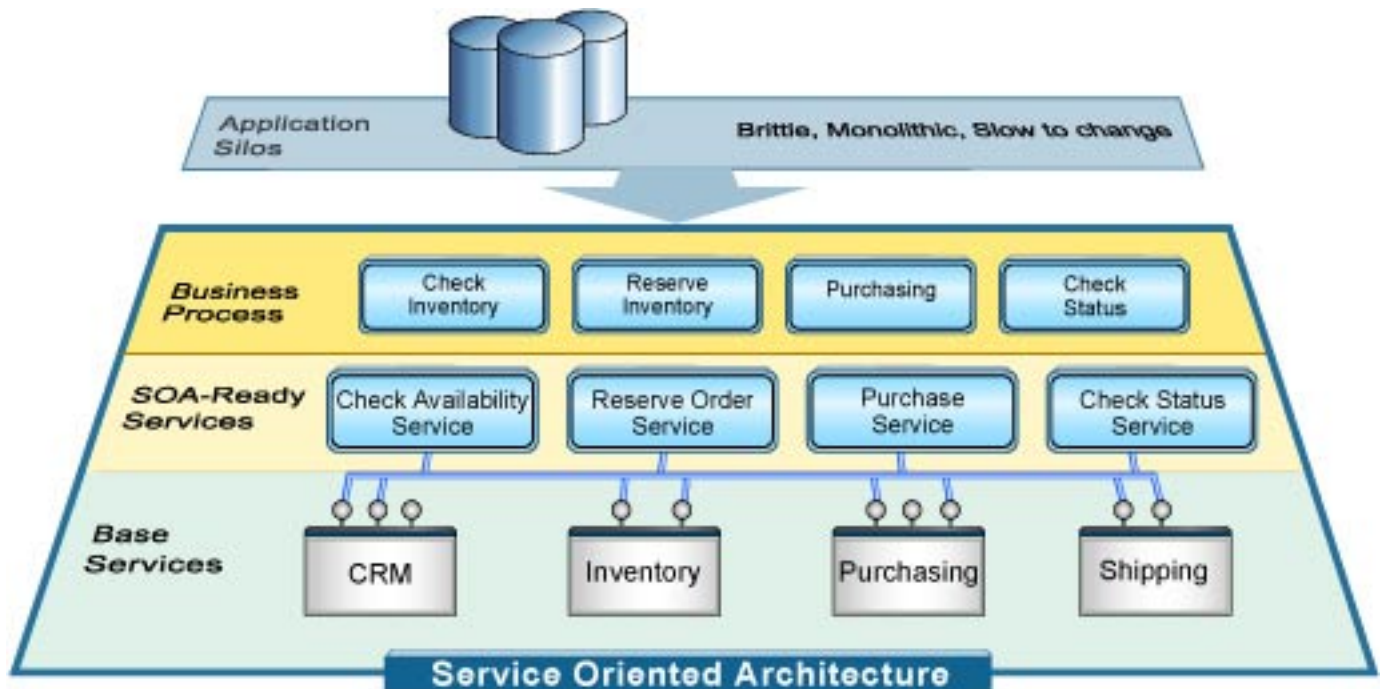
There are different "levels" of SOA usage that an organization can pursue. Some organizations are completely changing the way they approach software development and integration by establishing SOA program offices and training all of their developers to follow SOA design principles. Others who simply wrap an application with an interface are also using SOA principles though to a lesser degree. SOA does not need to be top-down, enterprise-wide; SOA can be pursued on an application-by-application or project-by-project basis. One of the benefits of SOA is that it does not require an organization to change all of their applications to an SOA to get any benefit. Companies can pursue a variety of strategies. Some organizations choose to make only future applications services oriented. Others take legacy applications and service enable them as they need to connect to other applications. While migrating to SOA, a significant ROI can be attained at every level. Because SOA is all about reuse, often the first project yields positive ROI.

Definition

There are many definitions of SOA, however, most definitions center around application functionality that can be discovered and reused through loosely coupled, standards-based interfaces. One of the more focused definitions comes from CBDI Forum which states that SOA are:

Policies, practices, frameworks that enable application functionality to be provided and consumed as sets of services published at a granularity relevant to the service consumer that can be invoked, published and discovered, which are abstracted away from the implementation using a single, standards-based form of interface.

Other definitions may reference “network-available software units” or “business-level services” yet these are essentially different ways of describing the same concept.



Flexible, adaptable, secure and extensible

Figure 1: SOA is often described as application functionality that is published and discoverable by calling applications as part of an overall business process. SOA Ready services give context and relevance to base services for the calling applications or business process. This enables much better reuse, flexibility and cost savings.

SOA environments are typically highly decentralized, with physically fragmented application functionality located throughout an organization. These services are discoverable and accessible by service consumers. Service interfaces are abstracted from back end applications decoupling interface from implementation details such as application type and operating system. Back end services still require context and relevance to the service consumer for them to be reusable. Exposing hundreds and thousands of services does not constitute a SOA until those services are “user-friendly” or “SOA ready” to the calling applications and with the appropriate infrastructure capabilities like security, monitoring, interoperability and standards support attached to them.

SOA Redux

SOA's focus on reusability is not a new concept and has been around for years. Notable attempts at achieving cross-system reusability include CORBA and DCE. They similarly had standardized interfaces and were callable by any application which similarly followed those standards. One might argue that most middleware products are SOA's, however, this implementation approach requires everyone to use the middleware vendor's set of proprietary interfaces as the "standardized interface."

Reasons why these technologies never hit the mainstream included:

- They were difficult to use and required a high level of expertise to coordinate and implement.
- They focused on exposing programming level objects, not business level components
- They implied an underlying programming model and were difficult to implement on top of a wide variety of legacy systems
- They did not have a standard that had total industry-wide support
- The approach tended to take significant time to implement, be very expensive and most importantly was very brittle.

One of the key principles of SOA is loose coupling which allows the architecture to remain flexible and agile to change. These past approaches can certainly be described as SOA but often were so tightly coupled that they were applicable only for the most high-end and expensive of projects.

Along Came Web Services

The standards that are synonymous with Web Services are changing the playing field. XML, SOAP, WSDL and UDDI serve as the cornerstone of Web Services and are dramatically lowering the cost of deploying standardized interfaces within and across organizations. Integration technology is now available at the grassroots level, enabling application developers, even casual desktop users to be able to fully leverage value-added services. The fact that there is significant progress on standards and a virtual monopoly of supporters from the vendor and SI community are significant drivers to the success of Web Services and SOA. Early success stories from end users and the commitment shown by developers and architects have made Web Services and service orientation a foregone conclusion.

What does this all mean?

Many analysts and thought leaders in the industry believe that SOA is the next big wave to hit IT organizations. What is all the hype about?

Time Frame	Revolution	Computing Paradigm	Architecture
1970s	Mainframe	Monolithic	Single tier
1980s	Midrange	Departmental	Single tier
Early 1990s	Client-server	Power to the desktop for knowledge users	2-tier architecture (Server, application)
Late 1990s	Web	Broad-based portal applications to back end systems	3-tier architecture (Database, server, client)
2000s	SOA	Services based application infrastructure	Services-based

Figure 2: Many experts deem SOA as the next big IT revolution enabling IT organizations to be better aligned with business requirements and providing the flexibility and agility to respond to change better, faster and cheaper.

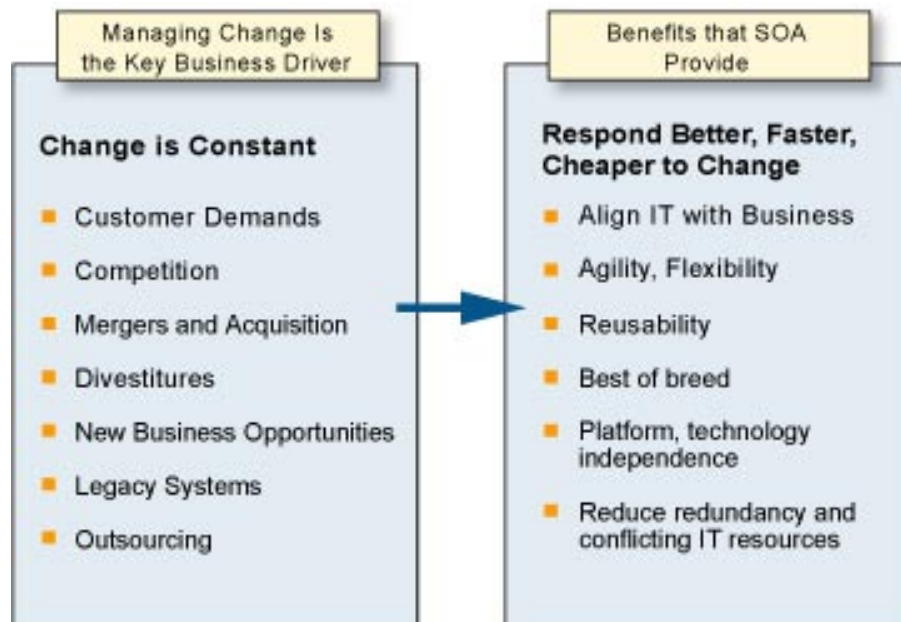
A convenient starting point begins several decades ago, when mainframe systems brought automation and computing power to companies. Complex and core data processing, which were central to the organization could be offloaded to these expensive machines with large monolithic applications. Mid-range computers allowed many organizations and even individual departments to leverage computing power to suit their needs. The client-server revolution brought computing power to the desktop. This mirrored changes in the organization where individual employees become knowledge workers and needed the tools and capabilities to do their jobs. The architecture changed to be more two-tiered with server applications providing the heavy lifting and processing while the application logic moved to the desktop. A top down approach called CASE methodology became a popular methodology for creating applications.

In the last decade, web-based technologies and thin-clients have driven the agenda, putting business logic back at the server while also providing application access to a much broader base, including every worker, partner and customer relevant to the organization. At around the same time, object orientation was bringing component-based technology to developers building applications. SOA is the next big revolution based on previous standards like SGML, XML and HTTP. SOA enables application access and reuse throughout the entire organization.

Some have described a massive change in the way IT organizations will operate. Just as moving from mainframe to client-server dramatically changed the IT organization, SOA is predicted to also cause a similar disruption. Back in the early 1990s, client-server architecture became highly popular with skills required for database, thick client applications and client-server network technologies. During the Web revolution, experts in application servers and Web oriented technologies became highly valued as applications became available to a wider audience. In the SOA world, many are predicting that there will be additional specialization in creating and managing components and assembling and reusing them.

Why do we need SOA

SOA has many benefits, the most common rationale of which are flexibility and agility. The fact is that SOA enables you to respond to change better, faster and cheaper. Many organizations have recognized that in order to best align IT with business needs, they need technology systems to match and respond to the needs of the business units. The pace of business and the challenges associated with competition, increasing customer service, mergers and acquisitions and outsourcing require a flexible architecture that is adaptable to changing needs. This agility must also minimize the constraints of cost, time to market and technology risk.



IT organizations, that are deploying SOA, gain efficiency by enabling application developers to quickly assemble applications from different, already available components. This not only saves time and money by reducing duplication, but also encourages a consistency in business process because as services are reused, process, to some extent, is also reused.

SOA also reduces the dependence on vendors supplying monolithic solutions. Rather than having to choose one vendor for a fully integrated solution or platform, IT can more easily select best of breed technology to solve their needs. Monolithic application suites are predicted to be much less common given that a services-based architecture breaks up the “stovepipes” and enables companies to reduce their reliance on one vendor and customize applications to their business requirements.

IT organizations are moving to SOA so that they can better address the realities of business today which is all about being able to handle change. Changes can be long term activities that are proactively pushed by the organization or unexpected changes that require immediate action. An SOA environment is flexible, adaptable and designed to handle change.

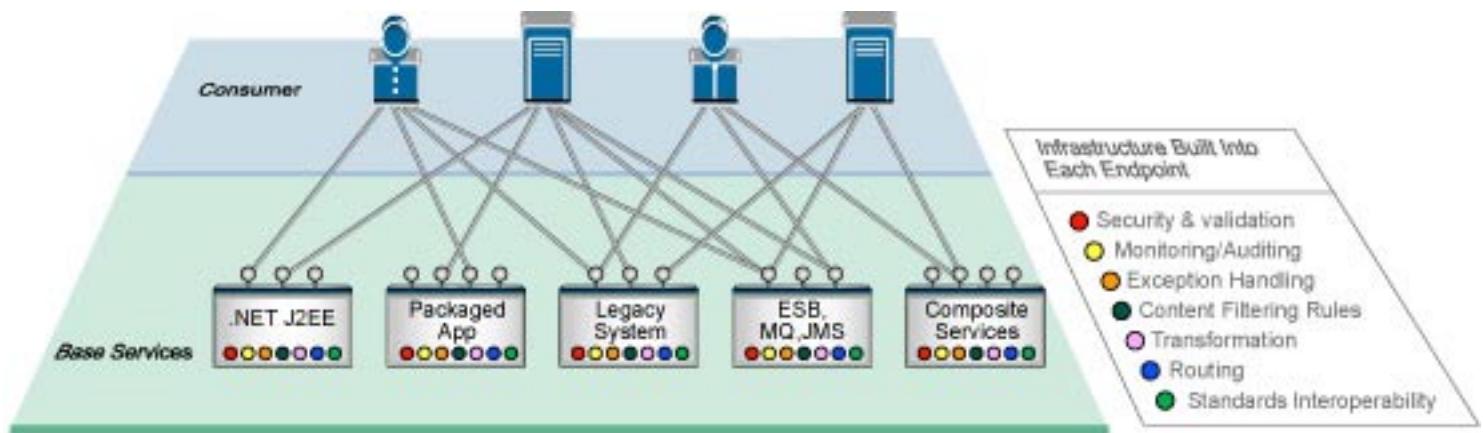
What is Needed for SOA?

Unfortunately, one cannot simply purchase SOA or deploy SOA by having a few meetings. SOA requires discipline, organization and the right tools to deploy effectively and maintain it ongoing.

From an organizational and process standpoint, some best practices include:

- Creation of a centralized forum for exchanging plans and information on services
- Policies and incentives that encourage developers to create services and for business units to reuse services
- Tracking and regular evaluation to determine usage patterns and to allocate funds appropriately
- Obtain skill sets in component management and assembly

In terms of tools and technologies, Web Services standards help considerably with the need to institute standards-based interfaces. Web Services however, does not equal SOA. While Web Services solves some important interoperability issues, Web Services networks increase in complexity over time and can result in complicated connection points, redundant infrastructure and inconsistency.



Complex, Redundant, Inconsistent, Unmanageable

Figure 3: Web Services is an important part of SOA but can still be highly complex and, introduces redundant infrastructure and inconsistencies. Over time, Web Services networks increase in complexity and become very costly to manage.

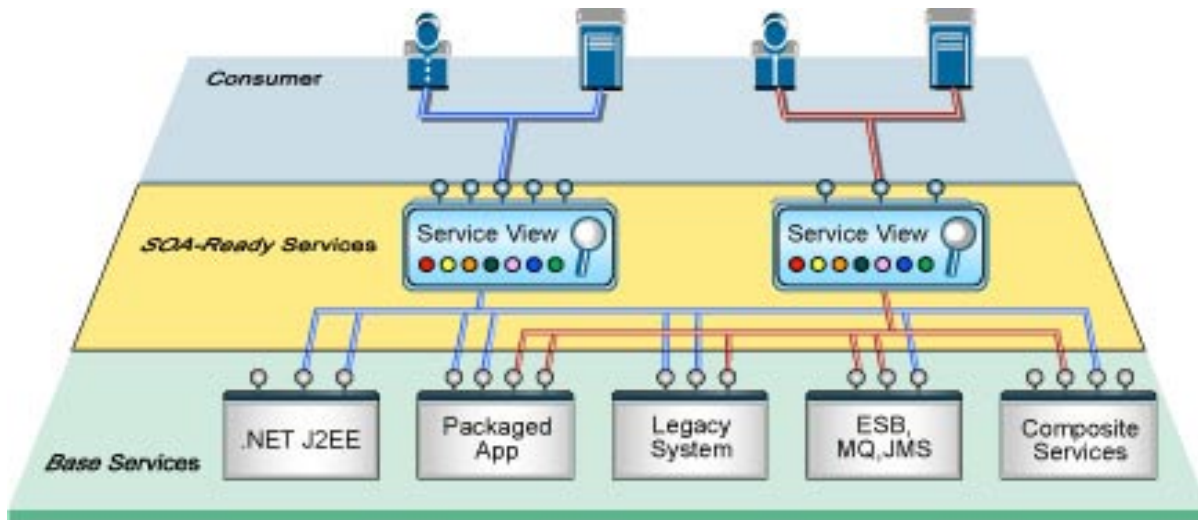
Web Services provides some of the following benefits such as:

- Separation of interface and implementation
- Support for standards-based interfaces
- Support for mechanisms to dynamically discover and bind to services

However, SOA environments have many requirements above and beyond use of Web Services. These requirements include:

- Separation of application business logic from operational infrastructure functionality.
- Address security of new componentized architecture and preventing uncontrolled access to every service.
- Address unreliability of service parts as part of a larger application process
- Service contract between consumer and providers to govern information interchange
- Support for business services relevant to the consumer, aggregated from back end services

These requirements can all be encapsulated through abstraction, an absolute requirement for all SOA environments. Architects and analysts have varying names for this requirement, including service virtualization, service facades and service views. Through the use of an SOA-Ready abstraction layer, common infrastructure elements can be shared across all services resulting in reusable services that are simpler to manage and built for change.



Abstracted, Efficient, Secure, Flexible, Scalable

SOA Ready Services

- Shared Services Infrastructure
- Hidden Complexity
- Reusable Services
- Built for change

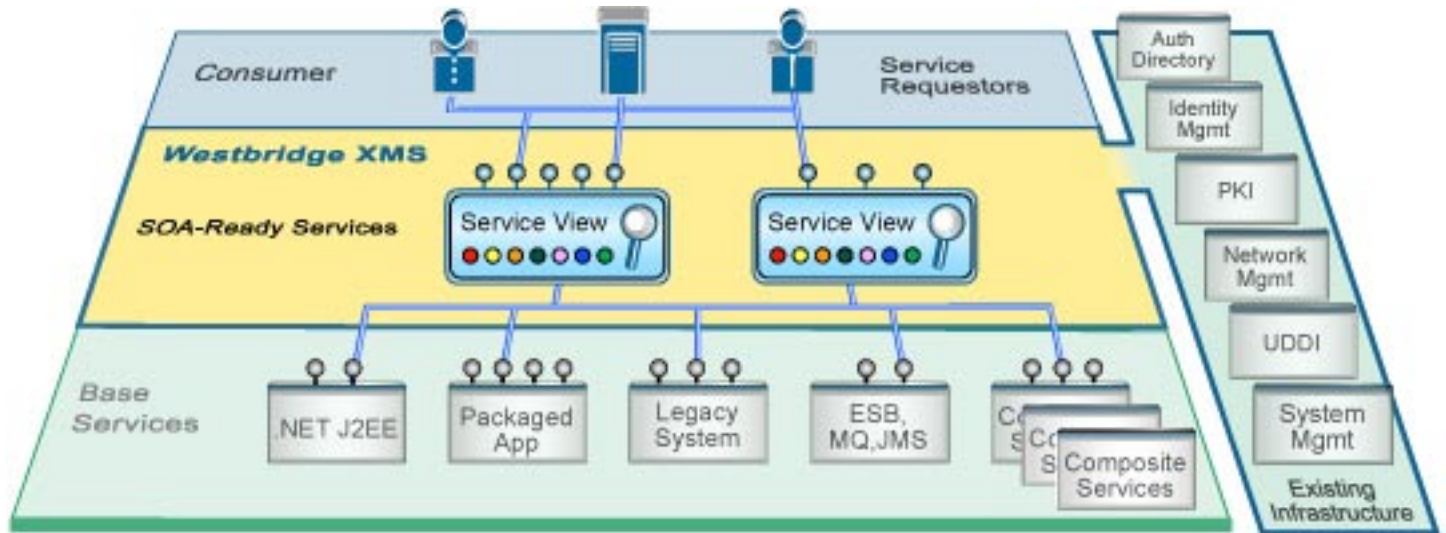
Infrastructure Built Into Each Endpoint

- Security & validation
- Monitoring/Auditing
- Exception Handling
- Content Filtering Rules
- Transformation
- Routing
- Standards Interoperability

Figure 4: SOA-Ready services provide many of the requirements necessary for SOA above and beyond the base Web Services standards. An SOA Ready abstraction layer provides efficiency, security, flexibility, reusability and ultimately lets organizations scale their service environment.

How does Westbridge Technology Enable SOA

Westbridge Technology provides critical technology for enabling SOA. While the Westbridge Technology flagship product XML Message Server (XMS) is often marketed as an XML Firewall, it does much more than simply secure the XML traffic on the periphery. The Westbridge XMS is highly value-added, non-invasive technology that acts as an SOA shared services gateway. It provides much of the necessary infrastructure for securing and managing SOA environments.



Requires No Change of Base Services

<p>Each Service View</p> <ul style="list-style-type: none"> • Provide instant security, interoperability, monitoring, routing, and auditing • Enables contracts between consumer and provider supporting local and global policies • Automatically supports latest standards • Support instant interoperability • Leverage existing infrastructure • Hide back end complexity 	<p>Shared Infrastructure Rules</p> <ul style="list-style-type: none"> ● Security & validation ● Monitoring/Auditing ● Exception Handling ● Content Filtering Rules ● Transformation ● Routing ● Standards Interoperability
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Figure 5: The Westbridge XMS provides shared SOA security infrastructure that provides security and interoperability for Web Services environments. Westbridge enables you to leverage your existing infrastructure most effectively for SOA.

One of the key infrastructure strengths of Westbridge is the ability to publish Service Views. Service Views are an abstraction of the back end services and enable you to aggregate back end services and republish them with the necessary infrastructure and control needed for SOA.

Service Views provide the following benefits required for SOA

- Instant security, interoperability, monitoring, routing, and auditing
- Enables contracts between consumer and provider
- Automatically supports all the latest standards
- Support instant interoperability with variety of technologies, standards and semantic requirements
- Leverage existing infrastructure for services communication
- Hide back end complexity
- Can be controlled by different administrators from different departments

Each Service View controls who has access down to the individual service operation/method call. Service Views also support both local and global policy rulesets, enabling administrators control on individual services or across all services or groups of services with just one rule.

Customers can publish as many Service Views as they desire to fit the customized requirements of each type of service consumer. Service Views enable organizations to powerfully and flexibly control the communication within the organization as well as externally in a B2B environment.

Westbridge has many deployment options that fit what the particular needs are. The XMS can be deployed as software running on Linux, Windows, Solaris and other Unix machines. The Westbridge XMS is also available as an appliance that supports hardware-based performance acceleration. The Westbridge XMS can also be deployed as a gateway type model or as an agent at the endpoint depending upon the customer's needs and requirements.

To find out more about the individual features and capabilities of the Westbridge XMS, please visit www.westbridgetech.com for datasheets and more whitepapers.

Value Westbridge Technology Provides to SOA?

Westbridge XMS is critical infrastructure for enabling SOA to remain cost effective and flexible to change. The Westbridge XMS is designed to slash time to market for SOA-related projects while minimizing risks. The Westbridge Service View capability enables organizations to instantly create SOA Ready services that are adaptable and reusable.

SOA Ready services are better aligned to business functions enabling you to turn Web Services into a SOA. Westbridge XMS

Minimizes risk and exposure

- Provide security protection across all of your services with minimal disruption
- Provide tools to increase business continuity
- Service Views insulates IT organizations from standards change.

Maintains Flexibility Required for SOA

- Enable your Web Services to remain truly loosely coupled even while adding functionality such as service contracts, security, and rule processing
- Business functionality is separate from common, infrastructure services such as authentication increasing flexibility
- Support an architecture where new standards and technologies can seamlessly replace the old
- Enable your services to respond to change, better faster and cheaper
- Provide standardized interfaces to mask underlying service complexity and present business-ready services

Provides Efficiency and Cuts Costs

- Service views are relevant, business level services that can be composed quickly and customized for different audiences
- Dramatically cut development and ongoing maintenance costs by up to 77% according to one Fortune 500 high tech manufacturer
- Ensure that common functions, such as authentication, auditing or reporting, are, in fact, common—providing consistent service and no unnecessary or confusing redundancy
- Service Views enable you to deploy production-class, SOA-Ready Web Services in a fraction of the time

Westbridge Technology is critical technology to power your SOA environment. With the Westbridge XMS, IT organizations can attain some of the following sample benefits:

- Experts in a particular business function never waste time building core services such authentication, routing and monitoring services. This results in less coding by IT staff and less code maintenance
- Organizations benefit from consistent, application-level security that is purpose-built for Web Services and SOA standards and processes
- Changing policies and adding new requirements and standards does not require changing either endpoints – the consumer or the Web Service, greatly speeding deployment of changes
- Services can be reused for many types of audiences, for consumers from within and outside the organization. Customizing a service to suit the needs of a new service consumer is as easy as provisioning a new Service View, a simple, point-and click process that does not involve changing the Web Service
- IT infrastructure, such as authentication directories, PKI infrastructure and monitoring tools are fully leveraged for Web Services providing consistency in security and monitoring, while avoiding duplication.
- Less reliance on single-vendor, monolithic solutions. Being able to support numerous standards and technologies by numerous vendors decouples implementation from integration

Westbridge reduces the cost of deployment and ongoing management while minimizing the risk associated with change. Customers have consistently indicated to us that the Westbridge XMS provides savings of up to 77% for SOA and Web Services related projects. The Westbridge XMS is critical infrastructure for turning your Web Services project into an SOA project and enables organizations to rapidly deploy SOA in a fraction of the time.

Find out more

Westbridge Technology is happy to assist organizations with their SOA projects. Westbridge provides a number of resources online at www.westbridgetech.com. There you may download datasheets and whitepapers that further describe the Westbridge XMS. If you have any questions, please do not hesitate to contact sales@westbridgetech.com for product specialist assistance.

