



# Extending the Benefits of SOA beyond the Enterprise

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## Executive Summary

The service-oriented architecture (SOA) approach to building enterprise IT infrastructures has gained widespread acceptance within the IT community. The benefits have been compelling—including the rapid deployment of new functionality that reuses existing code (lowering development costs), flexibility (improving responsiveness to business needs) and reduced maintenance costs (freeing staff to work on innovative new initiatives).

Although most SOA initiatives support applications within an enterprise, an even greater opportunity exists for using SOA to facilitate integration beyond the enterprise—between a company and its partners and customers. A business-to-business (B2B) infrastructure based on an SOA approach not only can lower development costs but can also deliver additional value chain economies and reduce project risks. And because an SOA can leverage the Internet and Internet-based standards, a business-to-business infrastructure based on an SOA approach has the potential to dramatically lessen the burden on partners and simplify the way companies communicate with their partners and customers.

TIBCO BusinessConnect™ 5.0 software enables companies to develop completely integrated business-to-business solutions based on solid SOA principles. Built on the TIBCO BusinessWorks™ business integration platform, BusinessConnect facilitates the seamless automation of business processes spanning from suppliers to customers and manages specific issues such as security, auditing, data integrity and trading community management. With over 20 years of experience in delivering business-to-business integration solutions and proven leadership in technological innovation, TIBCO is uniquely positioned to help you maximize the value of your partnerships.



## SOA—The Right Approach for Application Integration

The SOA approach to building enterprise IT infrastructures has gained widespread acceptance within the IT community. Prior to SOA, enterprise application functionality was often delivered via separate, monolithic applications that could not communicate. Integrating these applications was a time-consuming, costly affair and generally resulted in custom solutions that were not reusable. With an SOA, however, application functionality is partitioned into reusable components called services that perform discrete functions. These services can be combined to form composite applications that deliver higher order business functionality. The result is an IT infrastructure that allows for rapid deployment of functionality that is reusable, flexible and less costly to maintain.

To date, however, most SOA initiatives have been deployed “within the firewall,” that is, they have been used primarily to integrate applications within an enterprise. An even bigger opportunity, however, exists in applying the SOA approach beyond the enterprise to facilitate integration between a company and its partners and customers. In fact, many of the most commonly cited benefits of SOA—more effective integration with business partners, better supply chain collaboration, increased global sourcing and more effective use of external service providers—are business-to-business benefits. Clearly, realizing the full potential of an SOA approach involves extending its use beyond the firewall to facilitate the end-to-end automation of business processes throughout the entire ecosystem of partners and customers surrounding a company.

## SOA outside the Firewall: An Opportunity to Improve Collaboration

As a result of the move to more integrated value chains such as global outsourcing, business-to-business IT integration has become a competitive necessity in many industries. Yet because companies have little visibility into and no control over their partners’ systems, business-to-business integrations are much more difficult to design and deploy than internal integrations. Furthermore, a business-to-business infrastructure must handle specific issues such as security, auditing, transaction management and trading community management. As a result, many business-to-business systems are complex, cumbersome to deploy and expensive to maintain. By using an SOA approach, however, business-to-business systems can deliver on the same benefits as internal integrations—rapid deployment of reusable functionality, flexibility to adapt to changing needs and



reduced development and maintenance costs. And if built using platform-independent Internet standards such as SOAP and XML, an SOA has the potential to dramatically simplify business-to-business integration by making it much easier for partners with disparate systems to communicate with one another.

#### **Why Invest in SOA for B2B Now? One Word: Standards.**

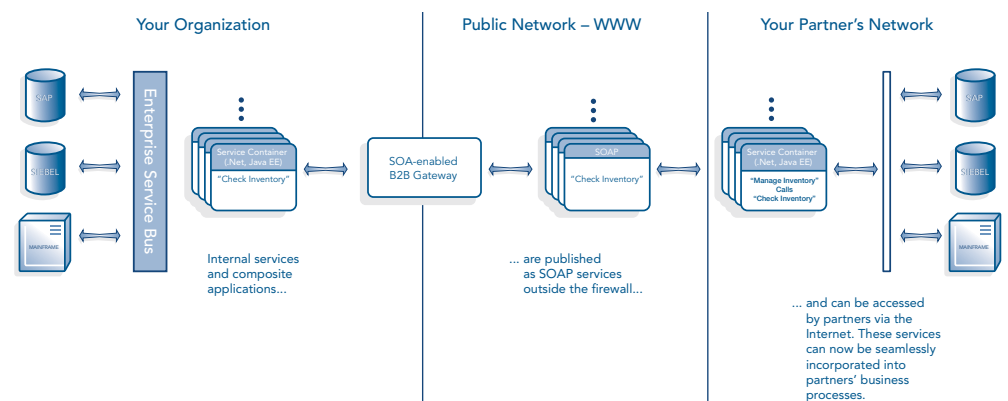
One huge challenge in business-to-business integration has been the lack of industry-wide standards for distributed computing. Although platform-specific distributed computing standards such as Common Object Model (COM) and Common Object Request Broker Architecture (CORBA) competed for dominance in the late '90s, it was not until the maturation of the Internet that truly platform-independent distributed computing standards, such as XML and SOAP, gained widespread acceptance. In fact, these standards were originally conceived with business-to-business functionality such as e-commerce hubs, third-party credit checks and outsourced logistics in mind. Coupled with an independent integration backbone that can expose virtually any kind of system, these new standards have helped platform-independent SOA become a reality. Companies that leverage this technology for business-to-business integration now have the opportunity to leapfrog their competitors, many of which are still mired in expensive, proprietary, legacy systems.

To illustrate the potential benefits of using an SOA approach to business-to-business integration, consider the example of vendor-managed inventory. Historically, a company might interact with its vendors via a custom-built, document-based electronic data interchange (EDI) system running on a private value-added network (VAN). Although this type of connectivity enables basic functionality, it has many limitations, especially if a company wants to take full advantage of the potential of B2B collaboration. For example, if the vendor wants to access inventory information from one or more of the customer's back-office systems, custom code must be developed. This information must be packaged and sent to the vendors via EDI. If any of the underlying systems change or if the information sent changes, the code must be modified. Additionally, each vendor has the burden of implementing its part of the end-to-end system and paying for an expensive VAN connection. Because such systems are static and inflexible, partners cannot access information such as inventory of a new product bundle in a dynamic fashion. Yet having this flexibility affords many of the benefits of collaboration, such as vendor-managed inventory.

Now consider how a vendor-managed inventory system could be built by applying an SOA approach. First, a composite application called "check inventory" might be created.

**Figure 1. Business-to-business integration using SOA**

This application might access several of the customer's backend systems and services. The customer can package the "check inventory" functionality as a Web service and make it available outside the firewall to its vendors. Vendors can use the Internet to access the "check inventory" functionality using a standard communication protocol such as SOAP. They do not have to write any custom code, and they do not have to pay for an expensive private network. Furthermore, the ecosystem (vendors and customers) can potentially access inventory information in a dynamic way by combining existing services or accessing third-party services published by a contract manufacturer or logistics provider. And when a company acquires a new vendor, there is no custom integration required; the vendor simply accesses the "check inventory" Web service and becomes part of the extended ecosystem supporting the customer.



By taking an SOA approach to business-to-business integration, as shown in Figure 1, a company can benefit in the following ways:

- **Lower development costs and project risks by reusing internal integration efforts.** Services created to automate internal business processes can be extended outside the firewall and made directly available to partners. This not only lowers costs through reuse but helps increase the return on investment of these internal SOA projects. Furthermore, by reusing tried and tested services already in production, project risks for B2B projects can be greatly reduced.



- **Gain additional value chain economies by simplifying end-to-end process automation.** With an SOA, composite applications can be created to automate business processes that span from your suppliers all the way to your customers.
- **Simplify the integration task for partners.** With an SOA approach, partners are insulated from the underlying complexity of your company's internal systems. With a URL to a Web service, partners can access whatever functionality you choose to expose to them. The Web service interface can remain unchanged even if your internal systems change, giving IT the confidence and flexibility to undertake internal upgrades without the fear of disrupting everyday business activities.
- **Rapidly add new partners.** An SOA approach takes existing Web capabilities, such as partner self-service, one step further. Processes can be built once and reused across multiple partners. And Web services, by definition, have standard interfaces that any partner can access without custom coding. This means that new partners can be acquired without building custom integration for each one. They simply subscribe to the pertinent services to gain access to the information and business logic that they need.
- **Gain extended benefits with dynamic collaboration.** Traditional business-to-business integrations are static and predefined. By delivering business-to-business functionality as a Web service, partners and customers can interact with your company in new ways as business needs evolve. For example, if you want to add a new product bundle or a new channel, the necessary core services are already in place—needing only to be reconfigured and published for the new product or new partner rather than recoded from scratch, greatly reducing development time.



## Are You Ready to Move beyond the Enterprise?

Although the potential benefits of leveraging SOA for business-to-business integration are huge, careful planning is the key to successfully using SOA in a B2B initiative. Below we have presented a checklist of issues unique to business-to-business transactions that must be considered when internal services are exposed outside the firewall.

- Security and authentication**—Any time you expose back-office systems outside the firewall, you must take steps to minimize the risk to your organization. Any business-to-business integration must provide mechanisms to ensure that the exchange of sensitive information, as well as the sharing of business services and processes over a public network, are done in a secure and reliable manner. The security functions must be robust enough to address issues at various levels, from securing the physical connection to encrypting the data itself. Additionally, any business-to-business integration must have a mechanism in place for authenticating partners and data, such as digital signatures.
- Auditing and non-repudiation**—Business transactions that occur with partners are legally binding and are usually defined in a legal contract. To ensure that those agreements are enforced, strict logs must be maintained of all transactions so the parties involved have an audit trail to help resolve disputes.
- Trading community management**—Of all the components of the business-to-business infrastructure, trading community management is perhaps the most critical. Managing and updating partner-specific business agreements, partner profiles, partner provisioning and partner security credentials such as digital certificates must be as automated as possible. It becomes cost-prohibitive to implement a B2B solution involving a large trading partner community of hundreds or thousands of partners if the host company needs an army of system administrators to keep it running.
- Data integrity and transaction management**—The integrity of processes and data must be maintained in the event of a failure in any part of the underlying infrastructure.
- Analytics**—Managers should be able to measure the value of the benefits a B2B solution brings, such as increased speed when filling orders, the reduction in the amount of buffer inventory kept on hand or the cost reduction of paying a vendor. The SOA infrastructure must give managers at all levels the ability to define metrics, monitor transactions and receive pertinent reports.



## TIBCO BusinessConnect 5.0: A Proven Infrastructure to Cost-Effectively Apply SOA Principles outside the Firewall

TIBCO BusinessConnect software was designed to enable companies to deliver business-to-business integration solutions based on TIBCO's proven SOA experience. Built on the TIBCO BusinessWorks business integration platform, BusinessConnect allows IT organizations to use an SOA approach to deliver functionality with all the business-to-business management features you need from a world-class B2B solution, such as security, auditing and partner management.

By leveraging an SOA approach, BusinessConnect 5.0 allows IT organizations to:

- **Reuse internal services and rapidly build B2B solutions.** With BusinessConnect, you can reuse internal services and composite applications and publish them as Web services outside the firewall to partners. New services can be rapidly assembled across both internal and partner systems. Services only need to be built once and then can be deployed to multiple partners.
- **Minimize development efforts for partners.** BusinessConnect allows you to deliver functionality to partners in the form of standards-based services over Internet protocols. This means that a partner does not have to write custom code or access a private network to communicate with you. They simply interact with you using popular standards such as Web services for whatever they need, whenever they need it. Furthermore, an SOA approach allows you to insulate partners from your underlying technology—if your back-office systems change, the Web service interface can remain the same.
- **Manage partners easily.** By leveraging the Internet and Internet-based standards, BusinessConnect enables trading partners of all sizes to collaborate with your company with minimal IT overhead. BusinessConnect provides Web-based self-service definition and administration of partner profiles and settings.
- **Ensure safety and security of all transactions.** BusinessConnect supports 56- and 128-bit Secure Sockets Layer encryption and S/MIME and uses digital signatures, X.509 certificates and public key infrastructure for authentication. Automated exception handling ensures the integrity of processes in the event of a failure in any part of the underlying infrastructure.



- **Measure the value of your partnerships.** With BusinessConnect, you can monitor business-to-business transactions in real time and define custom metrics for measuring the value of your relationships.

## **TIBCO: Experience in B2B, Leadership in SOA**

TIBCO has over 20 years of experience in delivering business-to-business integration solutions. With thousands of satisfied customers, TIBCO is the largest independent integration software company. Plus, TIBCO has proven itself to be a leader in innovation. Whether you currently have an internal SOA initiative in progress or not, TIBCO is uniquely positioned to help you deliver a business-to-business integration based on SOA principles. As a thought leader and visionary, TIBCO is far more than just an integration specialist—TIBCO is a strategic partner.



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