

IBM SOA Foundation: providing what you need to get started with SOA.

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Executive summary

As IT systems have grown exponentially, companies have been left to handle increasingly complex software architectures. Traditional architectures have reached the limit of their capabilities. But IT departments still need to respond quickly to new business requirements, continually reduce the cost of IT to the business, and seamlessly absorb and integrate new business partners and customers. The software industry has gone through multiple computing architectures designed to allow fully distributed processing. It has also had to deal with programming languages designed to run on any platform and greatly reduce implementation schedules. And it has developed a myriad of connectivity architectures designed to allow better and faster integration of applications.

Now, service oriented architecture (SOA) is the next evolutionary step to help IT organizations meet their ever more-complex challenges. This white paper discusses how you can implement an SOA that suits your unique business requirements based on IBM SOA Foundation software.

IBM SOA Foundation can help you extend the value of the applications and business processes that currently run your business. It is an integrated, open-standard-based set of software, best practices and patterns that is designed to provide what you need to get started with your SOA. Rather than being a replacement for your existing infrastructure or investments, IBM SOA Foundation is interoperable and fully modular – allowing you to select components on a build-as-you-go basis by adding components as new requirements need to be addressed. You can also readily enhance IBM SOA Foundation with capabilities from other components of the broader IBM software portfolio. And because IBM SOA Foundation is scalable, you can start small and grow as fast as the business requires. IBM SOA Foundation also provides extensive support for business and IT standards to facilitate greater interoperability and portability between applications.

Understanding SOA: Important terms

- **Service:** a repeatable business task, such as *check customer credit* or *open new account*
- **Service orientation:** a way of integrating your business processes as linked services, and the outcomes that these services bring
- **Service oriented architecture (SOA):** an IT architectural style that supports service orientation
- **Composite application:** a set of related and integrated services that support a business process built on SOA

SOA: the key to maximizing business flexibility and reuse

As today's marketplace globalizes, new markets, new workforces and new competitors drive companies to look for new ways to adapt to change more quickly. In the past, organizations might have needed to make significant changes on a yearly basis. Now, market forces require businesses to make these same levels of changes on a monthly, weekly or even daily basis. Business leaders who have been focused on cost-containment must now focus on growth – a goal that demands the flexibility to be more nimble than competitors. At the same time, companies still want to control costs by making better use of the investments that they already have.

Although the marketplace might demand flexibility, your business can be only as flexible as the IT systems that support it. Without standards or best practices as a guide, you've probably grown your business processes bit by bit, piece by piece, over time. The same thing happens when you focus your architectural policies and application purchases on solving specific, ad hoc issues. The outcome is an infrastructure that is inflexible and very difficult, expensive and time-consuming to change.

The desire for integration and IT flexibility is not new. As a result, several techniques exist, each optimized to handle a particular situation. Point-to-point connections provide simple, basic connectivity between applications through a messaging backbone. Enterprise application integration (EAI) makes it easier to manage a larger number of connections.

SOA blends the best of these concepts into a new architecture that combines adaptable connections with well-defined, standards-based interfaces to help you build flexibility into your existing infrastructure. You can reuse SOA services extensively, regardless of whether they are based on new services implementations or existing IT assets. SOA also commands a much greater degree of organizational commitment by driving your organization's focus toward business-level activities and interactions rather than technical sub-tasks. Because this commitment acts as a unifying force between business and IT, the resulting collaboration delivers greater business value by helping you to ensure that your systems are optimized to support your organization's business requirements, and are able to improve and adapt continuously as your needs change.

Building an SOA is the next stage of integration—but it is no longer just for early adopters. Now is the right time to adopt an SOA approach. The standards and technology required to support SOA are in place and have broad industry support. SOA uses widely adopted Web services standards to help ensure interoperability between services through well-defined interfaces. And the software that your business needs to support SOA is mature, integrated and available today. The IT community has learned from its cumulative experience of early engagements, and has established a set of best practices to help you understand how to adopt an SOA that suits your business needs, along with a roadmap for success. Also, the market momentum around SOA suggests that companies like yours are probably adopting SOA to achieve a strategic advantage—an important consideration in a fiercely competitive marketplace.

IBM: The right choice for your SOA

Success with SOA starts with a flexible, robust infrastructure that can be used in conjunction with your existing infrastructure and IT assets to create more business value. You also need industry-specific knowledge and best practices to implement your SOA—as well as an IT partner that can provide leading-edge skills, assistance and best practices in SOA.

IBM is uniquely positioned to deliver these important assets to you, because IBM understands service orientation—and your business. The company's unmatched breadth and depth of investment in SOA totals more than US\$1 billion per year. As part of this investment, IBM plays a leadership role in more than 50 standards bodies and holds more than 300 SOA-related patents. IBM also has extensive industry experience in SOA with over a 1000 SOA clients all over the world in industries like yours. IBM also has a thriving ecosystem of IBM Business Partners who can help you implement your own unique SOA.

The SOA life cycle

IBM clients have indicated that they think about SOA in terms of a life cycle. They start in the *model* phase by gathering business requirements and designing their business processes. After processes are optimized, they implement them by *assembling* new and existing services to form these business processes. They then *deploy* these assets into a highly secure and integrated services environment. After the business processes are deployed, IBM clients manage and monitor these business processes from both an IT and a business perspective. Information gathered during the *manage* phase is fed back into the life cycle to enable continuous process improvement. Underpinning all of these life-cycle stages are *governance and processes* that provide guidance and oversight for the SOA project. (See Figure 1)

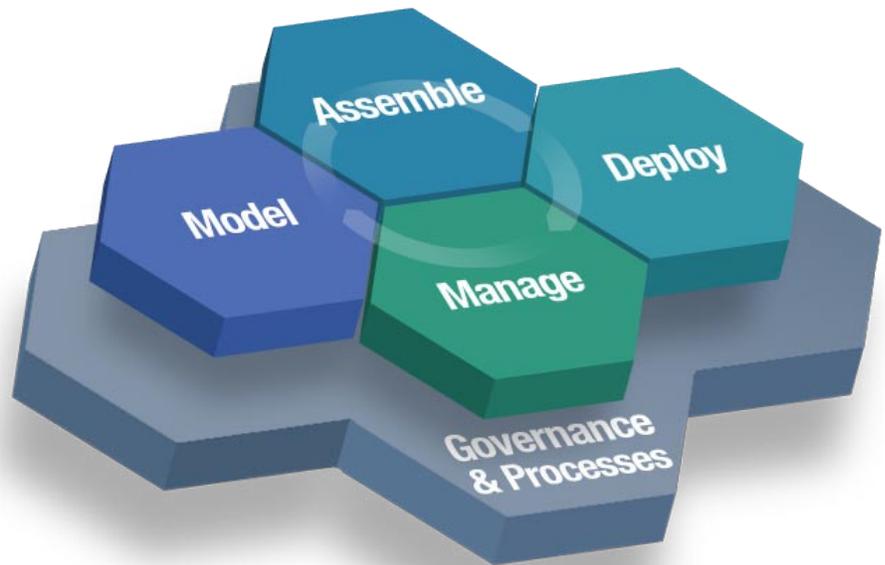


Figure 1. The SOA life cycle

Model

You begin the *model* phase by gathering and analyzing business requirements that you then use to model, simulate and optimize your business processes. The resulting business processes are used to design associated software services and service levels to support these processes. During this phase, you use a model to establish a common understanding between business and IT of your business processes, objectives and outcomes, as well as to help ensure that the resulting application meets your defined business requirements. This model also provides a base line from which to measure business performance.

Assemble

During the *assemble* phase, you create services out of existing assets, such as enterprise resource planning (ERP) and financial systems, IBM CICS® applications and other solutions that run your business. In many cases, a library of existing services can be used to find services that already exist in your organization. If no functionality exists, you can create and test a service to deliver the functionality required for a particular business process. After the required services are available, the services are orchestrated to implement a business process.

Deploy

During the *deploy* phase, you configure and scale the run-time environment to meet the service levels required by your business processes. After a business process is configured, you can deploy it into a robust, scalable, highly secure services environment. This services environment is optimized to reliably run mission-critical business processes while providing the flexibility to make updates dynamically in response to changing business requirements. This service-oriented approach also reduces the cost and complexity associated with maintaining numerous point-to-point integrations.

Manage

The *manage* phase involves establishing and maintaining service availability and response times, as well as managing underlying services assets. You can monitor key performance indicators (KPIs) in real time to get the information you need to prevent, isolate, diagnose and fix problems. Understanding the real-time performance of your business processes enables you to provide vital feedback to the business-process model to enable continuous improvement. This phase also involves managing and maintaining version control over the services that make up your business processes. The management phase ultimately enables you to make better business decisions sooner than previously possible.

Governance and processes

Governance and processes are critical to the success of any SOA project. To help ensure success, you might choose to create a center of excellence within your business to implement governance policies and to follow proven international governance standards of control objectives for information and related technology. Implementing strong governance policies can result in successful SOA projects—and also has the potential to result in higher profits and increased shareholder value.

“IBM technology provides the core software for our SOA. We have invested in our people and our processes so that now we are fully realizing the benefits we first envisioned five years ago. We now have over 70 applications in production on this architecture.”

– Ian Muir, senior manager,
Core Technologies, Standard Life

IBM SOA Foundation

IBM SOA Foundation is an integrated, open-standards-based set of software, best practices and patterns that is designed to provide what you need to get started with your SOA. The software that comprises IBM SOA Foundation has been carefully selected from the leading-edge IBM software portfolio to support each stage of the SOA life cycle. IBM SOA Foundation can help you extend the value of the applications and business processes that currently run your business. It is not a replacement for your existing infrastructure or investments. Instead, IBM SOA Foundation is interoperable and fully modular—allowing you to select components on a build-as-you-go basis by adding components as new requirements need to be addressed. You can also readily enhance IBM SOA Foundation with capabilities from other components of the broader IBM software portfolio. And because IBM SOA Foundation is scalable, you can start small and grow as fast as the business requires. IBM SOA Foundation also provides extensive support for business and IT standards to facilitate greater interoperability and portability between applications.

SOA reference architecture

IBM SOA Foundation is based on an SOA reference architecture that defines the comprehensive IT services required to support your SOA at each stage in the SOA life cycle. (See Figure 2)

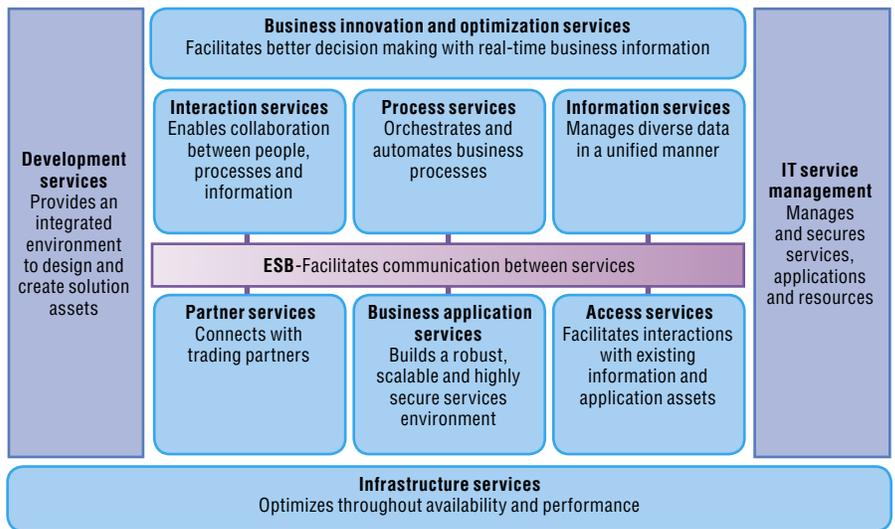


Figure 2. The SOA reference architecture

Model

Development services. IBM SOA Foundation offers a unified, roles-based development platform that allows each member of your SOA development team to efficiently complete tasks based on their skills, their expertise and their roles within your enterprise. During the modeling phase, tools are provided for business analysts to evaluate business requirements, and model and simulate business processes.

IBM software. IBM SOA Foundation provides the following products to support the model phase of the SOA life cycle:

- *IBM WebSphere® Business Modeler*
- *IBM Rational® Software Architect*

Assemble

Development services. During the assemble phase, tools for software architects enable them to model data, functional flows, system interactions and so on. Integration specialists can use these specialized tools to configure the interactions between services in business processes. IBM SOA Foundation provides tools for creating new services, enabling developers to create new business logic with little concern for the underlying platform.

IBM software. IBM SOA Foundation provides the following products to support the assemble phase of the SOA life cycle include:

- *IBM WebSphere Integration Developer*
- *IBM Rational Application Developer*

Deploy

ESB. The ESB delivers all of the interconnectivity capabilities required to use the services implemented across the entire architecture including transport, event and mediation services.

Interaction services. These services provide the capabilities required to deliver IT functions and data to users, meeting their specific preferences.

Process services. These services provide the control capabilities required to manage the flow and interactions of multiple services in ways that implement business processes.

Information services. These services provide the capabilities necessary to federate, replicate and transform disparate data sources.

Access services. These services provide bridging capabilities between core applications, prepackaged applications, enterprise data stores and the ESB to incorporate services that are delivered through existing applications into an SOA.

Partner services. These services provide the document-, protocol- and partner-management capabilities for business processes that involve interactions with outside partners and suppliers.

Business application services. These run-time services include the necessary application components for the integrated system.

Infrastructure services. These services provide the ability to optimize throughput, availability and performance.

IBM software. IBM SOA Foundation provides the following products to support the deploy phase of the SOA life cycle:

- *IBM WebSphere Process Server*
- *IBM WebSphere ESB and IBM WebSphere Message Broker*
- *IBM WebSphere Partner Gateway and IBM WebSphere Adapters*
- *IBM WebSphere Portal*
- *IBM WebSphere Everyplace® Deployment*
- *IBM® Workplace® Collaboration Services*
- *IBM WebSphere Information Integrator*
- *IBM WebSphere Application Server*
- *IBM WebSphere Extended Deployment*

Manage

IT services management. These services provide capabilities related to scale and performance including edge services, clustering services and virtualization capabilities to allow efficient use of computing resources based on load patterns.

IBM software. IBM SOA Foundation provides the following products to support the manage phase of the SOA life cycle:

- *IBM WebSphere Business Monitor*
- *IBM Tivoli® Composite Application Manager*
- *IBM Tivoli Identity Manager and IBM Tivoli Access Manager*

More than just software

IBM SOA Foundation is more than just software. It helps create governance and processes to provide structure to your SOA through offerings such as IBM SOA Center of Excellence Workshops, IBM Rational Unified Process® and an IT infrastructure library. IBM SOA Foundation also offers SOA enablement through SOA-related guides, white papers and best practices based on extensive client experiences. And a variety of role-based education, including both in-person and Web-based distance learning are available to help you develop skills that can help you build your SOA.

Take advantage of industry-leading know-how and best practices

IBM provides IBM SOA Industry Accelerators, industry-specific assets that share IBM know-how and best practices gleaned from working with IBM clients and IBM Business Partners – and to help you solve your business problems. IBM SOA Industry Accelerators extend the value of IBM SOA Foundation by providing:

- *Best practices in the form of practical how-to guides to apply proven practices to solution implementation*
- *Industry and solution-specific versions of the SOA reference architecture*
- *Industry-standards-based models to help create business processes, information and data models, and user interfaces.*
- *Software components from both IBM and IBM Business Partners to accelerate solution assembly and deployment*

IBM SOA Industry Accelerator reusable assets provide a number of benefits. They deliver faster value to your business by improving your ability to implement projects—faster and at a lower cost. You can also reduce your risk, because the assets you'll be using have already been successfully used by other IBM clients. The result? A more flexible and responsive business.

Conclusion

SOA is the next evolutionary step in IT architecture developed to help organizations meet their ever more-complex challenges, including responding quickly to new business requirements, reducing the cost of IT to the business and seamlessly absorbing and integrating new business partners and customers. IBM SOA Foundation is an integrated, open-standard-based set of software, best practices and patterns that is designed to provide what you need to get started with SOA.

For more information

To learn more about IBM SOA Foundation, contact your IBM representative or IBM Business Partner, or visit:

ibm.com/soa



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