

Assessing Your SOA Readiness

A Technical White Paper
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Chapter 1

Executive Summary

Overview

The service-oriented architecture (SOA) is not new, but it is rapidly emerging as the premier integration and architecture framework in today's complex, heterogeneous computing environments. While the concept of SOA has existed for years, there were few standards that enabled open, interoperable, non-proprietary integration solutions. Today, many software vendors are moving at a frenetic pace to support SOA. Web services and SOA are not equivalent, however, SOA realized using Web services is generating new found excitement in the integration world. Additionally, organizations must understand that SOA is not realized by merely flipping a switch or porting your existing services to some vendors software platform. For long-term success, companies must put SOA in their IT "DNA" and develop an overall SOA strategy that aligns their IT and business goals.

This whitepaper provides a brief introduction to SOA as well as its benefits and challenges. It also introduces Sun services designed to help customers assess their SOA readiness and develop a sound plan, strategy, and architecture to achieve SOA success.

What is SOA?

As stated, SOA stands for "*service-oriented architecture*", an architectural style that emphasizes well-defined, loosely coupled, coarse-grained, business-centric, reusable shared services. As the name implies, *services* are the core of SOAs. *Services* are well-defined encapsulations of business assets. They are network based, described using standards-based interface languages, such as the Web Services Description Language (WSDL), and accessed via Web-based protocols such as the Simple Object Access Protocol (SOAP). A service can be accessed by any client capable of making SOAP invocations. However, services are typically accessed by Business Process Execution Language (BPEL) engines, portals, and/or applications. Additionally, services descriptions and APIs are published in a common registry to enable easy discovery by potential service consumers.

Web services is a term that refers to a set of eXtensible Markup Language (XML)-based technologies that have emerged in the past several years that offer an opportunity for realization of SOA in a more ubiquitous manner than previous SOA-enabling technologies. Examples of Web services technologies are SOAP, Universal Description, Discovery and Integration (UDDI), WSDL, electronic business XML (ebXML), Security Assertion Markup Language (SAML), WS-Security, and BPEL. Each of these standards and related implementations are of minor value in isolation, but when combined appropriately, they offer an opportunity for organizations to deliver on the promises of SOA that have remained elusive to date.

The Benefits of SOA

The major business impacts of moving to a more service-oriented architecture are two-fold:

- Reduced time to market (TTM) for new services
- Reduced total cost of ownership (TCO) of IT infrastructure and business services

The first of these, reduced TTM, is achieved by enabling IT architects and developers to focus their efforts more on developing and delivering unique business service logic, and less on middleware. Service designers are able to “compose” applications by integrating one or more services. The chance of achieving reduced TTM is increased by defining standard business processes and associated infrastructure to allow choreography of services based on “business process models” (BPM).

The next SOA benefit, reduced TCO, is achieved in two ways:

- Eliminating costly, proprietary middleware and replacing it with equally capable, open standards-based Web services technologies
- Consolidating well-defined business functions into services that can be shared by multiple business units

Thus, the SOA theme is *enable reuse via shared services*.

Challenges in Moving to SOA

Many companies face the challenge of how to best utilize SOA to solve their business problems. Since SOA is based on open standards and is frequently realized using Web services, making sense of the Web service specifications and standards also adds to the confusion, causing many customers to “wait it out.”

Organizations should be aware of several important SOA realities to dispel any myths or misunderstandings regarding the best approach to a smooth transition to SOA, including:

- *SOA is an architectural style that has been around for many years.* While there are new ways to realize SOA, including the use of Web services technologies, leveraging the experience of a services organization well-versed in SOA is essential to understanding technologies and techniques necessary to gaining the business benefits of SOA.
- *Successful SOA is about more than deploying software.* Organizations must evaluate their funding and governance models, analysis and design techniques, development methodology, deployment and support plans, and partner/customer/supplier relationships.
- *Moving to SOA is no small feat.* It can and should be done incrementally, but requires a shift in how we architect and compose services-based applications while maximizing existing technology investments.

Sun’s approach to SOA considers these often overlooked realities and guides organizations interested in realizing the benefits of SOA, including reduced time to market (TTM) and reduced total cost of ownership (TCO) for new business and IT services, by providing a roadmap for a careful, phased migration to SOA. The roadmap considers organizational strategies, methodologies, and technology choices.

The remainder of this white paper is organized in the following manner:

- **Section 2:** SOA Impact Analysis — Identifies critical SOA enablers and areas of impact to consider when developing a strategy for SOA within an organization, relating specifically to technology and tools, organizational alignment, and methodology and process
- **Section 3:** Sun’s SOA Readiness Assessment — Describes Sun’s approach to readying customers for SOA, deliverables and benefits of a SOA Readiness Assessment, and how to get started on the road to SOA by engaging SunSM Services expertise
- **Section 4:** Additional SOA Services and Resources — Identifies additional Sun education, architecture, and implementation services of value to organizations making a move to SOA

Chapter 2

SOA Impact Analysis

Given the major potential of SOA to radically improve business competitiveness and reduce IT costs, it stands to reason that an assessment of key organization and technology impact areas is essential to both mitigate risks and maximize opportunities for business benefits from SOA. Such an assessment, focused on critical SOA success factors that are based on best practices, provides an informed basis for development of a phased SOA migration plan that delivers early, measurable, and incremental benefits while avoiding major disruptions.

Key areas of impact that warrant such review are:

- Technology and Tools
- Organization Alignment
- Methodology and Process

A description of each category, as well as examples of critical success factors relevant to each, are provided in the following sections.

Technology and Tools

SOA success is highly correlated to the choice of technology and tools utilized in both *design-time* and *run-time* environments, as well as the way in which those technologies and tools are designed to interplay to deliver a true service-oriented solution.

In the design-time environment, SOA readiness is impacted by how well the integrated development environment (IDE) extends to support rapidly emerging SOA implementation standards, especially Web services protocols. Design, development, testing, and deployment tools must support unique protocols and attributes of SOA, and critical infrastructure is necessary to support publication and discovery of new and existing services.

In the run-time environment, SOA readiness demands an infrastructure that supports secure, interoperable, and reliable messaging between services, and is capable of orchestrating service interactions to support business process demands.

Choosing the appropriate tools and technologies is not sufficient to achieving SOA success alone. The use of appropriate design and message exchange patterns is critically important. These enabling patterns allow organizations to deliver and utilize services in a repeatable manner to ensure consistency and adherence to best practices necessary to scaling SOA across the organization.

Examples of SOA success factors pertinent to technology and tools include:

- **Identity** — Appropriate use of security protocols, centralized identity credential stores, identity provisioning, and key management systems, as well as consideration of federated identity where applicable
- **Registration/Discovery** — Implementation of registry and repository technology to enable publication of service records, metadata, and support and escalation procedures
- **Service API** — Appropriate use of WSDL and XML schema definition for description of technical binding specifications and data definition
- **Tiering/Layering** — Separation of end-to-end processing into n tiers, and implementation of each tier in a layered manner to increase architectural flexibility and reduce management and support burden
- **Loose Coupling** — Appropriate use of interface styles and messaging patterns that reduce the potential for tight coupling based on underlying platform and programming model exposure
- **Pattern Usage** — Identification and usage of architectural patterns specific to SOA, including message exchange patterns (MEPs), appropriate Java™ 2 Platform, Enterprise Edition (J2EE™) core patterns (Web Broker, others), and MicroArchitectures (well-aligned aggregated pattern sets)
- **Creation and Deployment** — Use of the IDE and toolset that enables easy exposure of business logic as Web services, including SOAP facades and WSDL generation, integrates well into the service deployment platform of choice, and is supported by an ecosystem of compatible plug-ins to easily add new functionality and standards support
- **Standardized Data Model** — Standardization across the organization on a common XML schema-based data model — in alignment with industry-specific and cross-industry data schema standards efforts — to minimize overhead and problems associated with data translations and transformations between services
- **Separation of Business and IT Services** — Differentiation of mission-aligned business functions from common enabling IT functions such as authentication, authorization, logging, and notification, to enable greater specialization of services and reduce time to market (TTM) of new business services
- **Interoperability and Open Standards Basis** — Use of true open standards for interfaces between services, as well as coordinated standards usage guidance, especially WS-I profiles, to increase probability of interoperability between services; choice of a programming platform with proven commitment to support existing and emerging WS-I profiles in a comprehensive, timely manner; choice of a deployment platform vendor that also displays a commitment to support key SOA interoperability standards

Organizational Alignment

The extent to which an organization has aligned their business and technology strategies is a key determinant of SOA readiness. It is important to evaluate the business strategy for well-defined business services and processes, and to evaluate the technology strategy for separation of mission-aligned business services from enabling but non-mission-specific IT infrastructure services. Also pertinent is the organizational alignment with respect to a funding model and a centralized versus decentralized IT group strategy. Organizations with a funding model that facilitates cross-unit cost sharing are typically much more successful in migrating to SOA than those with more rigid, inflexible funding models. Other important strategic SOA evaluation criteria include the centralized versus decentralized IT group strategy, as well as any in/out-sourcing strategies. Many SOA-ready organizations are decentralizing business services while centralizing IT infrastructure services, thus enabling quick response to changing market demands for the business services and gaining consistency and cost-control for the IT infrastructure services.

Examples of SOA success factors pertinent to organizational strategy include:

- **Shared Services Strategy** — Existence of a strategy to identify overlapping business and IT functions with the intent of reducing or eliminating redundancies and overlaps through use of shared services
- **Funding Model** — Existence of an IT funding model aligned with and supportive of a shared services strategy

Methodology and Process

Adoption of an iterative methodology is critical to support quick, efficient, service-oriented analysis and to design lifecycle activities that complement SOA. Also, formal governance and operations procedures make an organization more likely to adapt to SOA. New techniques for model-driven architecture that heavily involve visual business process and service interaction modeling approaches are beginning to emerge, and are also important to evaluate.

Examples of SOA success factors pertinent to methodology and process include:

- **Governance Model** — Policies and procedures for the identification of necessary services, coordination of complementary or conflicting service development efforts, and full lifecycle management of services from proposal to support
- **Model-Driven Architecture** — Familiarity and/or usage of emerging approaches and technologies that enable development of service-oriented models to facilitate interaction and communication of requirements and logic between business analysts, architects, developers, and testers

Recommended Approach

Any organization's strategy for moving to SOA should involve the following four major activities:

- **Education** — Gain an understanding of key SOA architectural principles, concepts, best practices, and technologies
- **Assessment** — Determine the current state of your organization's readiness for moving to SOA by identifying existing best practices and gaps, as well as major opportunities for realization of benefits from SOA
- **Planning** — Develop a phased SOA migration plan that makes sense for the organization, mitigating business and architectural risks while measuring and delivering significant return on investment (ROI) through increased flexibility and responsiveness to changing market demands, as well as decreased design, development, integration, and support costs
- **Execution** — Deliver prototypes, pilots, infrastructure, and services consistent with the phased SOA migration plan, seeding and embedding SOA perspective and best practices throughout the business and technology groups within the organization as well as among key customers, partners and suppliers

While each of these activities is equally important, one of the best ways organizations can get started today in participating in the SOA value proposition is to perform an assessment of how well-aligned their current environment is with SOA principles and best practices.

Evaluating key areas of impact and the success criteria specific to each will enable an organization to identify both existing best practices as well as areas of concern that must be addressed to begin the migration to SOA. Conducting such an assessment of an organization's SOA readiness is best done by engaging experts who have developed formal evaluation criteria, metrics, and best practices to compare against and provide a basis for developing a set of tactical and strategic recommendations.

Sun Services has developed such a service offering, the Sun SOA Readiness Assessment, which is described in detail in the next chapter.

Chapter 3

Sun's SOA Readiness Assessment

Recognizing the challenges customers face in moving to a truly service-oriented architecture, Sun Microsystems has developed an *SOA Readiness Assessment* service offering that leverages our years of experience in delivering enabling technology solutions that meet the unique needs of each customer. Sun's SOA Readiness Assessment provides customers with an analysis of their organization's readiness to move to a service-oriented architecture that is consistent with Sun SOA recommendations, a set of best practices specifically developed to complement this service offering. This assessment service is performed by experienced Sun Client Services architects and consultants over a 3-9 week period, and involves four major activities:

- **Discovery** — Determine existing business and technology strategies, methodologies, processes, infrastructure, and enterprise application integration (EAI) and business-to-business (B2B) architectures through interviews and document collection.
- **Analysis** — Compare existing state evidence to Sun SOA guidelines to determine best practices and gaps.
- **Working Sessions** — Sun architects and consultants will conduct multiple 1-2 day architecture working sessions with key customer stakeholders to identify SOA opportunities and challenges, explain findings, and validate tactical and strategic recommendations formulated during the SOA Readiness Assessment.
- **Findings** — Deliver SOA Readiness Assessment results in the form of a written report and/or onsite presentation to key customer stakeholders. The SOA Readiness Assessment will include both tactical and strategic recommendations for migration to a service-oriented architecture.

The key deliverable of the SOA Readiness Assessment service is a report that identifies the current state and the best practices within the organization being evaluated, identifies major concerns or gaps, and provides recommendations and a high-level SOA roadmap that considers the unique goals and challenges of the customer organization. This report is presented in a document format as well as a formal presentation to the customer to enable dialogue and to discuss a plan for executing on the SOA roadmap.

Customers engaging Sun Client Services for a SOA Readiness Assessment will benefit by:

- Gaining an understanding of their relative readiness for moving to SOA
- Identifying best practices within their organization to leverage further when moving to SOA
- Identifying critical concerns that must be addressed in the move to SOA
- Gaining an in-depth understanding of Sun SOA guidelines and recommendations from experienced Sun Client Services architects and consultants

Sun's SOA Readiness Assessment service is most valuable when delivered in concert with other Sun SOA services outlined in the following section, including an Architecture Workshop for SOA and consulting/architecture services.

Chapter 4

Additional Sun SOA Service Offerings

Sun has assembled a number of predefined and custom services and resources to help customers gain an understanding of SOA and to develop and execute a well-formulated SOA strategy.

SOA Service Offerings

Based on significant experience defining and delivering service-oriented architectures for customers across industries and geographies, Sun Services has developed a series of service offerings that can be leveraged individually or in combination with the SOA Readiness Assessment to introduce SOA in an incremental, phased manner that suits the unique needs of the customer organization. These services include a new Architecture Workshop for SOA as well as a range of existing consulting and architecture services to help customers at all stages of their move to SOA.

Architecture Workshop for SOA

Sun's Architecture Workshop for SOA provides customized training on SOA concepts tailored to an organization's needs. The workshop is initiated with a preengagement questionnaire. Based on the questionnaire, the SOA architects will analyze the customer's business environment and current technology capabilities, thereby enabling personalization of the workshop with respect to the customer's needs. The audience for the workshop ranges from senior-level business executives to lead architects and software developers. The core goals are as follows:

- Educate the customer on the key business and technical aspects of SOAs and Web services
- Educate the customer on Sun's SOA and Web service strategies
- Demonstrate to the customer the business value of SOAs and how Web services is used as an enabling technology in building them
- Provide the customer with adoption strategies that address the business and technology concerns faced when using this technology
- Provide a brief overview of the components of Web services technology and the associated key architectural principles
- Discuss how the technology is maturing, and what this may mean with respect to its use now and in the future
- Discuss the architecture, design, and development of Web services, providing a holistic view and addressing application development (for example, Java Web Services Developer Pack and Java 2 Platform, Enterprise Edition (J2EE) technology), data modeling and management, and infrastructure
- Discuss the principal challenges surrounding the deployment, provisioning, management, and maintenance (for example, versioning) of Web services

Architecture Services

Once an organization has assessed their SOA readiness, the next step is to define a migration plan for SOA and begin executing on one or more projects that deliver the technology infrastructure and early implementation successes necessary to establishing organizational momentum toward SOA.

Sun's consulting and architecture services provide customer's with the expertise and guidance to cooperatively define an SOA migration plan, SOA reference architecture, and SOA reference implementation. These services build upon Sun's SOA Readiness Assessment by utilizing the resulting findings and recommendations as input to the definition of and early execution on the SOA migration plan. Key functional and service-level requirements are identified and analyzed, as are use cases and scenarios necessary to fully understanding the customer's unique challenges and architectural risks, and a reference implementation in the form of a prototype or pilot is developed and delivered to begin the move to SOA. Architects delivering these architecture services leverage Sun Services' unique iterative architecture and development methodology, which is based on the Rational Unified Process (RUP) with emphasis on service-level qualities and risk mitigation.

Key goals and deliverables of these custom-quoted architecture services applied to SOA include:

- Analyze the customer business, functional, and service-level requirements
- Identify significant architectural risks associated with a move to SOA
- Develop an SOA migration plan that includes a phased approach to moving the organization to SOA
- Define an SOA reference architecture that constitutes a recommended approach to realizing services that meet the requirements and constraints of the organization
- Develop and deploy an SOA reference implementation that proves the architectural approach and mitigates significant architectural risks associated with the analyzed requirements.

Customized SOA Consulting

Sun Services architects and consultants are available to meet the unique needs of customers not addressed in the predefined service offerings by engaging on a custom basis, matching Sun's subject matter experts with customer personnel on an as-needed basis for periods ranging from days to months to years.

Onsite Mentoring

Sun's custom services are typically delivered via a mentoring model, with Sun architects and consultants working directly with appropriate customer personnel to ensure knowledge and skills transfer occurs.

Chapter 5

Getting Started

Remaining competitive and responsive in today's quick-paced world is forcing IT organizations to rethink their technology strategies, with SOA offering the best opportunity for delivering the architectural flexibility necessary to achieve significant reductions in time to market (TTM) and total cost of ownership (TCO) for new business and IT services.

Gaining the benefits of SOA while maximizing current technology investments is achievable, but requires a well-thought strategy that considers the impact of SOA on technology and tools, organizational alignment, and methodology and process. Based on Sun's many years of experience in helping customers make the move to SOA, we recommend that organizations get started by doing a formal assessment of their readiness for SOA. Sun's SOA Readiness Assessment is designed to help customers quickly identify gaps in their current environment, identify risks, and provide recommendations instrumental in planning a move to SOA.

Contact your Sun Sales Representative to learn more about these and other professional services involving Sun architects and consultants with the expertise to help your organization begin realizing the business benefits of a service-oriented architecture today. You can also learn more about Sun and SOA by visiting sun.com/service/consulting.

Sun Microsystems, Inc. 4150 Network Circle, Santa Clara, CA 95054 USA Phone 1-650-960-1300 or 1-800-555-9SUN Web sun.com



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