OASIS Reference Model for Service Oriented Architecture 1.0: Review and Critique

Mathew Duguid

Purdue University, Fort Wayne
CPET 545 | Fall 2008
31 August 2008
Introduction

The meaning of the terms “Service Oriented Architecture (SOA)”, in the context of computer software systems, varies depending on the source, but the non-for profit group OASIS has developed a reference model which provides a common abstract starting place for SOA. The objective of this paper is to critically review and summarize the SOA Reference Model presented in the article entitled “OASIS Reference Model for Service Oriented Architecture 1.0”.

OASIS SOA Reference Model Overview

According to the original OASIS Reference Model Technical Committee call for participation [2], the OASIS Service Oriented Architecture Reference Model Technical Committee (OASIS SOA-RM TC) was created to address the following problem statement:

“SOA as a term is being used in an increasing number of contexts and specific technology implementations, sometimes with differing - or worse, conflicting - understandings of implicit terminology and components. The proposal to establish a Reference Model is intended to encourage the continued growth of specific and different SOA implementations whilst preserving a common layer that can be shared and understood between those or future implementations.”

The problem statement also conveys the technical Committee’s proposed solution, a SOA reference model. According to the NASA reference cited in the SOA-RM TC charter [3], a reference model is defined as:

“a framework for understanding significant relationships among the entities of some environment, and for the development of consistent standards or specifications supporting that environment. A reference model is based on a small number of unifying concepts and may be used as a basis for education and explaining standards to a non-specialist.”

The reference model defines SOA at a very abstract level, meaning away from any software implementation, and it describes service-oriented architecture as an architectural paradigm, whereby needs and capabilities can interact via services [4].
There are four fundamental concepts of the SOA reference model as depicted below in Figure 1.

![OASIS SOA Reference Model Diagram](image)

**Figure 1. OASIS SOA Reference Model**

The following sections describe the fundamental concepts of the SOA reference model:

**Service:** The reference model starts with the notion that, in general, entities (people and organizations) create capabilities to solve or support a solution for the problems, or needs, they face in the course of their business. The mechanism by which needs and capabilities are brought together is referred to as a service, represented by the central concept in figure 1 above.

**Real World Effect:** The purpose of using a capability is to realize one or more real world effects. An interesting claim made by the reference model is that capabilities can be used without needing to know all the details because it is impossible to describe every effect from using a capability.

**Visibility:** refers to the capacity for those with needs and those with capabilities to be able to see each other. Visibility needs to be emphasized because it is not necessarily obvious how service participants can see each other.

**Interaction:** Whereas visibility introduces the possibilities for matching needs to capabilities (and vice versa), interaction is the activity of using a capability. An
interaction proceeds through a series of information exchanges and invoked actions

SOA is a means of organizing solutions that promotes reuse, growth and interoperability with the focus of Service Oriented Architecture being the task or business function accomplishing work.

**SOA and Web-Services Relationship**

The concepts of visibility and interaction require SOA implementations to utilize protocols and standards which are available to others. This requirement leads present SOA architecture implementations to favor web services such as:

1. SOAP or W3C
2. WSDL
3. XML-RPC

Web services provide a logical and convenient method of implementing SOA to provide interoperability for corresponding technologies available cross platform. However, web-services and SOA are sometimes, incorrectly, assumed to represent the same thing, but SOA is an architecture whereas web-services are a platform supporting SOA.

**Conclusions**

Defining a reference point for SOA has obvious and paramount importance to facilitate in the development of SOA implementations and ensure interoperability amongst the various SOA architectures. The reference model developed by OASIS provides the abstract starting point necessary for an environment of shared conceptualization of a strong SOA standard. But, as with all open standards, the success of the OASIS SOA reference model relies on the mutual acceptance and adaptation by the software industry.
Key SOA Terms Used Within

Capabilities - A real-world effect that a service provider is able to provide to a service consumer.

Interaction - The activity involved in making using of a capability offered, usually across an ownership boundary, in order to achieve a particular desired real-world effect.

Real World Effect - The actual result of using a service, rather than merely the capability offered by a service provider.

Service - The means by which the needs of a consumer are brought together with the capabilities of a provider.

Service Oriented Architecture (SOA) - Service Oriented Architecture is a paradigm for organizing and utilizing distributed capabilities that may be under the control of different ownership domains. It provides a uniform means to offer, discover, interact with and use capabilities to produce desired effects consistent with measurable preconditions and expectations.

Visibility - The capacity for those with needs and those with capabilities to be able to interact with each other.

References