Policies and contracts

Broadly speaking, a policy represents some form of constraint or condition on the use, deployment or description of an owned entity. Policies are inherently unilateral – any participant may have policies about issues that are important to them. A contract, however, is a policy that has been agreed to. Where a contract can refer to everything from the detailed description of the service interface to the legal contract entered into when two or more parties use a service. However, the SOA RM focuses on those agreements necessary for a successful interaction with a service.

Service Policy

Abstractly, a policy is an assertion that expresses an intent on the part of a participant. Policies apply to many aspects of SOAs: security, privacy, manageability, Quality of Service and so on.

Policy assertions may be, but need not be, written down in a formal machine processable form. Languages that permit policy assertions also range in expressivity from simple propositional assertions to modal logic rules. However, the SOA RM is neutral to how a policy is represented.

A natural point of contact between service participants and policies associated with the service is in the service description. It would be natural for the service description to contain references to the policies associated with the service.

Associated with policies is the concept of enforcement. Enforcement is simply the realization of the policy: an unenforced policy is simply an abstract logical proposition. However, how a policy is enforced, or even whether a policy is enforced is not a relevant part of the reference model.

A policy always represents a participants point of view. For example, a provider of a service may have a policy that all users of the service must be authenticated prior to their access to certain functions. This policy is one that may be enforced by the service provider independently of any agreement from potential users of the service. Similarly, someone’s agent may embody a privacy policy independently of any services the agent interacts with.

Service Contract

Where a policy represents an assertion from the point of view of a participant, a contract represents an agreement between two or more participants. Like policies, contracts can cover a wide range of aspects of services: quality of service agreements, interface and choreography agreements and commercial agreements. However, the concept of a service contract within the SOA RM applies primarily to the requirements for the successful use and provision of services.
A contract may be, but need not be, expressed in a machine processable form. It seems significantly likely that an executed contract will not be in a machine processable form; especially for commercial agreements. However, languages that can express policies, especially the more powerful variants can often also be used to express machine processable contracts.

Each contract may be associated with a life-cycle. This life-cycle has three main phases: a negotiation phase, an active phase and a completion phase.

While it is possible that a specific negotiation phase precedes an agreement to a contract, often it is more implicit. For example, merely attempting to interact with a service may represent an agreement to follow the prescribed procedures for using the service.

Often a contract specifies policies that are assumed to be in force during the active phase of the contract. As such, those policies are subject to enforcement in a similar that unilateral policies are.

Enforcement of an agreement will depend on the nature of the agreement: violating an infrastructure-level agreement is likely to lead to to errors and unexpected results. Violating a commercial agreement is likely to lead to loss of service or other legal remedies.

While there may be many kinds of contract, we envisage three main kinds of contract that may apply in service oriented architectures: the contracts that represent the valid use and provision of services, the contracts that represent the permitted uses of services and the contracts that result from using services.

For example, the service description may contain descriptions of the interfaces of a service – the kinds of data entities expected and the names of the operations supported – and may also contain choreographic descriptions of the order of interactions. Such descriptions may range from simple identifiers implying a mutually understood protocol to a complete description of the vocabularies, expected behaviors and so on.

However, a valid use of a service is not equivalent to a permitted use of the service. For example, one may present a syntactically correct request to a service for withdrawing money from an account. If that request is not accompanied by a suitable authentication, then that request is typically denied – it is not permitted. Many security considerations and quality of service considerations lie in this realm of agreement.

Often the purpose of interacting with a service is to effect a further agreement. For example, one use of a book-selling service is to cause a book to be purchased and delivered. This kind of contract is an important aspect of the rationale for deploying Service Oriented Architectures; however, such contracts are beyond the scope of this SOA RM.