

### 4.1.1.3 Model Elements Specific to Service Description

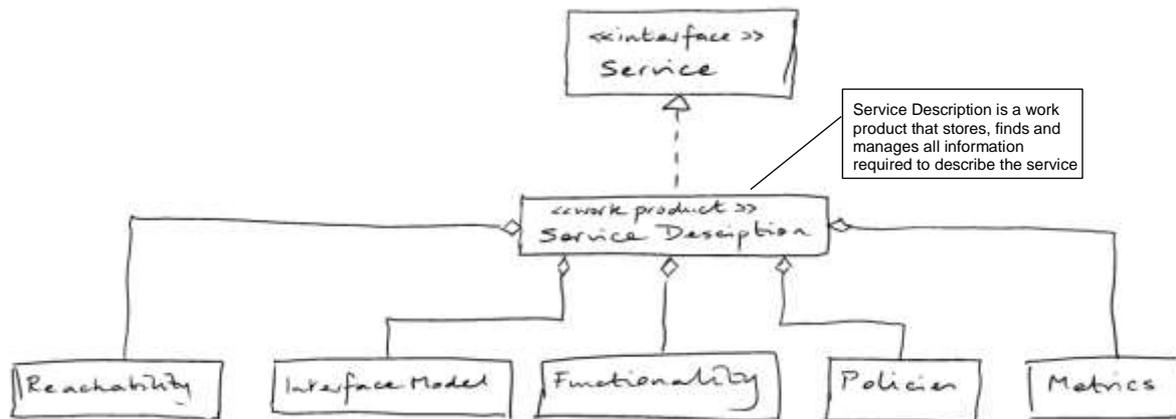


Figure 1 - Service Description

The major elements of the Service Description follow directly from the areas discussed in the Reference Model. Here, we discuss the service description elements shown in Figure 1 and the purpose served by each. The Service Description contributes to realizing the service interface and although it can be seen as a specific artifact, it is often a complex work product in its own right, managing all information that is required to completely describe the service offered..

For example, Service Policies as included in Figure 16 indicate those policies that affect conditions of use of the service; however, while the description may link to detailed policy documents, it is not the purpose of description to justify or elaborate on the rationale for the policies. Similarly, the Interface Model as included in Figure 16 captures information *about* the interface (including its information and behavior models, see below) –it is not the actual coded interface.

The subsections that follow describe how each element is reflected in the service description, not to elaborate on the details of that element.

#### 4.1.1.3.1 Service Interface

As noted in the Reference Model, the service interface is the means for interacting with a service. For the SOA-RAF and as shown in Section **Error! Reference source not found.** the service interface supports an exchange of messages, where

- the message conforms to a referenceable message exchange pattern (MEP),
- the message payload conforms to the structure and semantics of the indicated information model,
- the messages are used to denote events or actions against the service, where the actions are specified in the action model and any required sequencing of actions is specified in the process model.

The Interface Model shown in Figure 14 includes the information needed to carry out this message exchange in order to realize the described service behavior.

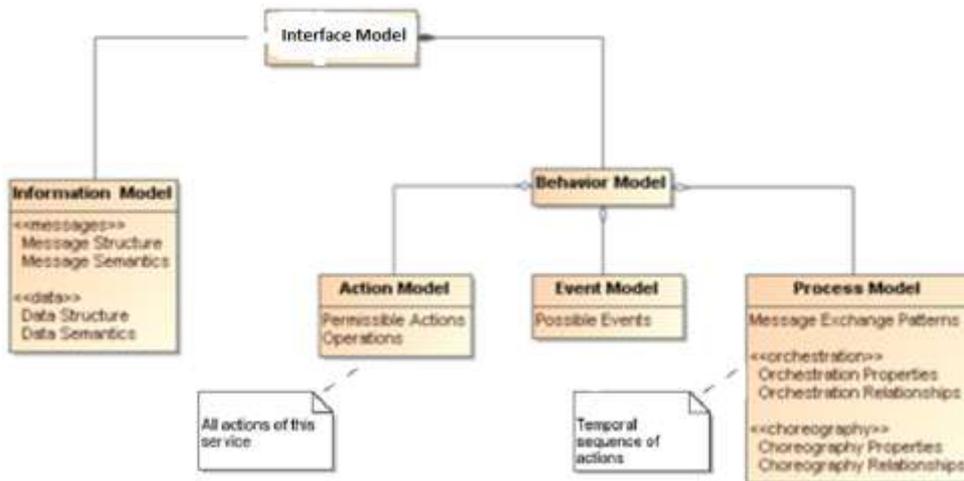


Figure 2 - Service Interface

Note we distinguish the structure and semantics of the message from that of the underlying protocol that conveys the message. The message structure may include nested structures that are independently defined, such as an enclosing envelope structure and an enclosed data structure.

These aspects of messages are discussed in more detail in Section **Error! Reference source not found.**

#### 4.1.1.3.2 Service Reachability

Service reachability, as modeled in Section **Error! Reference source not found.** enables service participants to locate and interact with one another. To support service reachability, the service description should indicate the endpoints to which a service consumer can direct messages to invoke actions and the protocol to be used for message exchange using that endpoint.

As generally applied to an action, the endpoint is the conceptual location where one applies an action; with respect to service description, it is the actual address where a message is sent.

#### 4.1.1.3.3 Service Functionality

While the service interface and service reachability are concerned with the mechanics of using a service, service functionality and performance metrics (discussed in Section 4.1.1.3.4) describe what can be expected as a result of interacting with a service. Service Functionality, shown in Figure 1 as part of the overall Service Description model and extended in the figure below, is a clear expression of service function(s) and the real world effects of invoking the function.

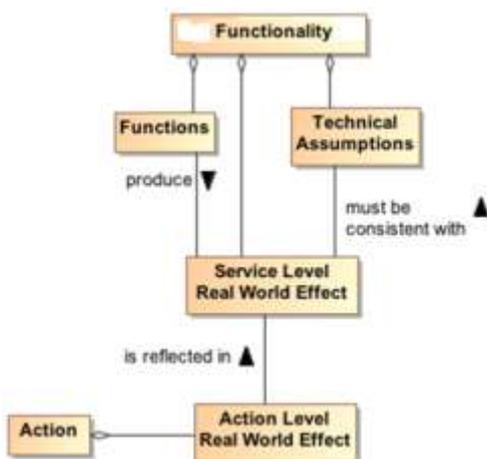


Figure 3 - Service Functionality

The Functions represent business activities in some domain that produce the desired real world effects. The Service Functionality may also be limited by technical assumptions/constraints that underlie the effects that can result. Technical constraints are defined as domain specific restrictions and may express underlying physical limitations, such as flow speeds must be below sonic velocity or

disk access that cannot be faster than the maximum for its host drive. Technical constraints are related to the underlying capability accessed by the service. In any case, the real world effects must be consistent with the technical assumptions/constraints.

In Figure 1 and Figure 3, we specifically refer to the descriptions of Service Level and Action Level real world effects.

### Service Level Real World Effect

A service level real world effect is a specific change in the state or the information returned as a result of interacting with a service.

### Action Level Real World Effect

An action level real world effect is a specific change in the state or the information returned as a result of interacting through a specific action.

Service description describes the service as a whole while the component aspects should contribute to that whole. Thus, while individual Actions may contribute to the real world effects to be realized from interaction with the service, there would be a serious disconnect for Actions to contribute real world effects that could not consistently be reflected in the Service Level Real World Effects and thus the Service Functionality. The relationship to Action Level Real World Effects and the implications on defining the scope of a service are discussed in Section **Error! Reference source not found.**

Elements of Service Functionality may be expressed as natural language text, reference an existing taxonomy of functions or other formal model.

#### 4.1.1.3.4 Service Policies, Metrics, and Compliance Records

Policies prescribe the conditions and constraints for interacting with a service and impact the willingness to continue visibility with the other participants. Whereas technical constraints are statements of “physical” fact, policies are subjective assertions made by the service provider (sometimes as passed on from higher authorities).

The service description provides a central location for identifying what policies have been asserted by the service provider. The specific representation of the policy, e.g. in some formal policy language, is outside of the service description. The service description would reference the normative definition of the policy.

Policies may also be asserted by other service participants, as illustrated by the model shown in Figure 4. Policies that are generally applicable to any interaction with the service are asserted by the service provider and included in the Service Policies section of the service description.

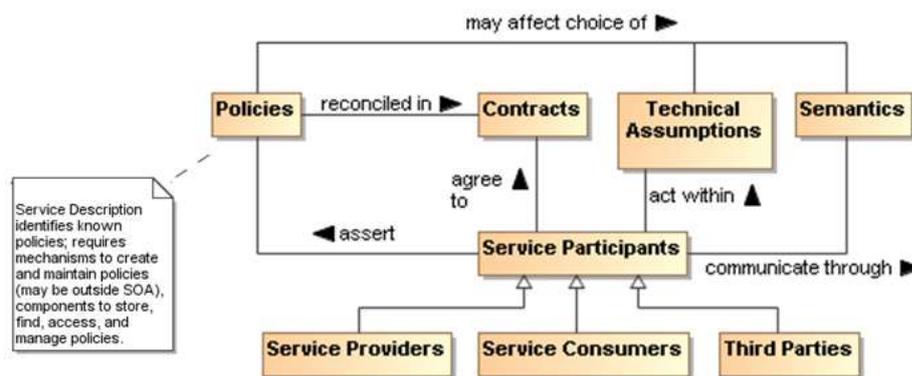


Figure 4 - Model for Policies and Contracts as related to Service Participants

In Figure 4, we specifically refer to policies at the service level. In a similar manner to that discussed for Service Level vs. Action Level Real World Effects in Section 4.1.1.3.3, individual Actions may have associated policies stating conditions for performing the action, but these must be reflected in and be consistent with the policies made visible at the service level and thus the description of the service as a whole. The relationship to Action Level Policies and the implications on defining the scope of a service are discussed in Section **Error! Reference source not found.**

As noted in Figure 4, the policies asserted may be reflected as Technical Assumptions/Constraints that available services or their underlying capabilities must be capable of meeting; it may similarly affect the semantics that can be used. For example of the former, there may be a policy that specifies

the surge capacity to be accommodated by a server, but a service that is not designed to make use of the larger server capacity would not satisfy the intent of the policy and would not be appropriate to use. For the latter, a policy may require that only services that support interaction via a community-sponsored vocabulary can be used.

Contracts are agreements among the service participants. The contract may reconcile inconsistent policies asserted by the participants or may specify details of the interaction. Service level agreements (SLAs) are one of the commonly used category of contracts.

The definition and later enforcement of policies and contracts are predicated on the potential for measurement; the relationships among the relevant concepts are shown in the model in Figure 5. Performance Metrics identify quantities that characterize the speed and quality of realizing the real world effects produced using the SOA service; in addition, policies and contracts may depend on nonperformance metrics, such as whether a license is in place to use the service. Some of these metrics may reflect the underlying capability, some metrics may reflect processing of the SOA service, and some metrics may include expected network overhead. The metrics should be carefully defined to avoid confusion in exactly what is being reported, for example, a case where the service processing time is reported as if it were the total time including the capability and network processing but is only measuring the service processing.

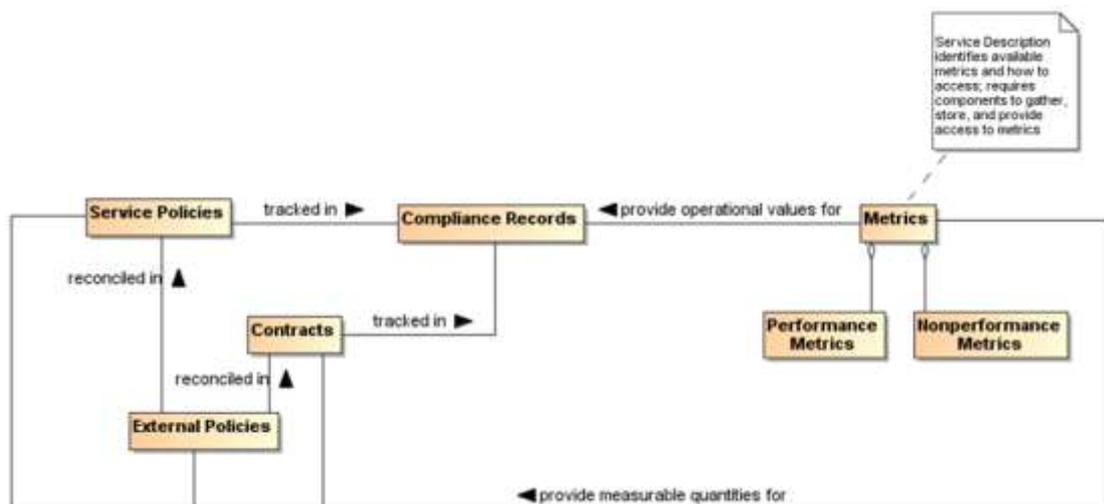


Figure 5 - Policies and Contracts, Metrics, and Compliance Records

As with many quantities, the metrics associated with a service are not themselves defined by this Service Description Model because it is not known *a priori* which metrics are being collected or otherwise checked by the services, the SOA infrastructure, or other resources that participate in the SOA interactions. However, the service description SHOULD provide a placeholder (possibly through a link to an externally compiled list) for identifying which metrics are available and how these can be accessed.

The use of metrics to evaluate compliance and the results of compliance evaluation SHOULD be maintained in compliance records and the means to access the compliance records MAY be included in the Service Policies portion of the service description. For example, the description may be in the form of static information (e.g. over the first year of operation, this service had a 91% availability), a link to a dynamically generated metric (e.g. over the past 30 days, the service has had a 93.3% availability), or access to a dynamic means to check the service for current availability (e.g., a ping). The relationship between service presence and the presence of the individual actions that can be invoked is discussed under Reachability in Section **Error! Reference source not found.**

Note, even when policies relate to the perspective of a single participant, policy compliance can be measured and policies may be enforceable without contractual agreement with other participants. While certain elements of contracts and contract compliance are likely private, public aspects of compliance should be reflected in the compliance record information referenced in the service description. This provides input to evidence that supports determining willingness as described in Section **Error! Reference source not found.**