The OASIS SOA Reference Model

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The SOA Reference Model

A reference model is an abstract framework for understanding significant relationships in a given environment.
The OASIS Reference Model is defined in terms of concepts and their relationships.
The OASIS View of SOA

- SOA is a paradigm for organizing and utilizing distributed **capabilities** that may be under the control of **different ownership domains**
  - Balancing service consumer needs against service provider capabilities
Key Concepts

- **Visibility**: Service consumers need to be able to “find” service providers
- **Semantics**: The interaction semantics need to be understood and communicated in advance of an interaction
- **Interaction**: The act of using a provided capability
- **Execution Context**: Path between consumers with needs and providers that fulfill the required capabilities
- **Real World Effects**: The purpose of using a capability is to “act” on a service to realize an intended “effect”
Service Concepts in a SOA Context

A Service
- Has the capability to perform work for another
- Defines the specification of work that it can perform for another
- Is available to perform work for another

Goals of SOA
- Create systems that are scalable, evolvable and manageable
Key Concepts of the Reference Model

- A **service** is a mechanism for a consumer to access one or more capabilities offered by the service.
- A **service provider** provides the capability.
- A **service consumer** uses the provided capabilities.
- A service consumer does not know about the service implementation beyond:
  - Capabilities provided via the service interface
  - Information necessary for consumers to learn if the service provides the capabilities that they need

Invoking a service either provides information that was requested, or drives a shared understanding of a state change between the service provider and service consumer.
Service Dynamics

- A service must be visible to consumers
- A common understanding of their interaction must be defined
- The real world effects of interacting with a service must be of value to the consumer
Service Visibility

 Visibility is essential to the consumer/provider relationship.

 In SOA, how a consumer “sees” a provider may not be obvious (e.g., they are not linked).

 **Awareness**: Requires service description and policy to enable one party to learn about the existence of the other.

 **Willingness**: A service provider and consumer must be willing to interact with each other.

 **Reachability**: A service consumer and provider must have the infrastructure to communicate with each other – they send and receive messages from each other.
Service Interaction

- **Information Model**: Governs the structure and semantics of messages exchanged and accepted by services.

- **Behavior Model**: What actions does the service perform, how does the service actions play in an end-to-end workflow.

- **Service Description**: Defines the formal contract associated with the information and behavioral models.
About Services

- Execution Context
- Service
- Contract & Policy
- Service description
Service Description

- **Service description** contains information needed to use the service
  - How to reach/find it
  - What function(s) the service can perform
  - What constraints and policies exist
  - How to interact with the service to achieve a desired outcome

- In web services a service description is encapsulated in a WSDL document
Policies & Contracts

A **policy** represents a constraint or condition of use associated with a service
- Who owns the policy
- How the policy is asserted
- How the policy is enforced
- Examples: Security, Privacy, Manageability, QoS

A **contract** represents an agreement between a service consumer and a service provider
- A contract is the result of ensuring a service provider and a service consumer comply with their parties respective policies.
The execution context represents the runtime instance capabilities needed to allow a service consumer’s capabilities to be consumed by a service consumer with needs.
Example: The IBM SOA RA – Based on Layers
The IBM SOA RA: Service Taxonomy

- **Business innovation and optimization services**: Provide for better decision making with real-time business information.
  - **Interaction services**: Enables collaboration between people, processes and information.
  - **Process services**: Orchestrate and automate business processes.
  - **Information services**: Manages diverse data and content in a unified manner.

- **ESB**: Enable interconnectivity between services.

- **Partner services**: Connect with trading partners.

- **Business app services**: Build on a robust, scalable, and secure services environment.

- **Access services**: Facilitate interactions with existing information and application assets.

- **Infrastructure services**: Optimizes throughout availability and performance.

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