Reference Architecture for SOA

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Menu

- SOA as ecosystem
- Three Views of SOA
  - Service Ecosystem View
  - Realizing SOAs View
  - Owning SOAs View

Systems and Ecosystems

- Multiple ownership domains
  - No one entity controls everything
- Parallel development, deployment and usage of services
- A medium for people* to get their business done

We include organizations and robots, but the canonical use case is people using an SOA-based system as a medium to `act at a distance'

Where the RA fits
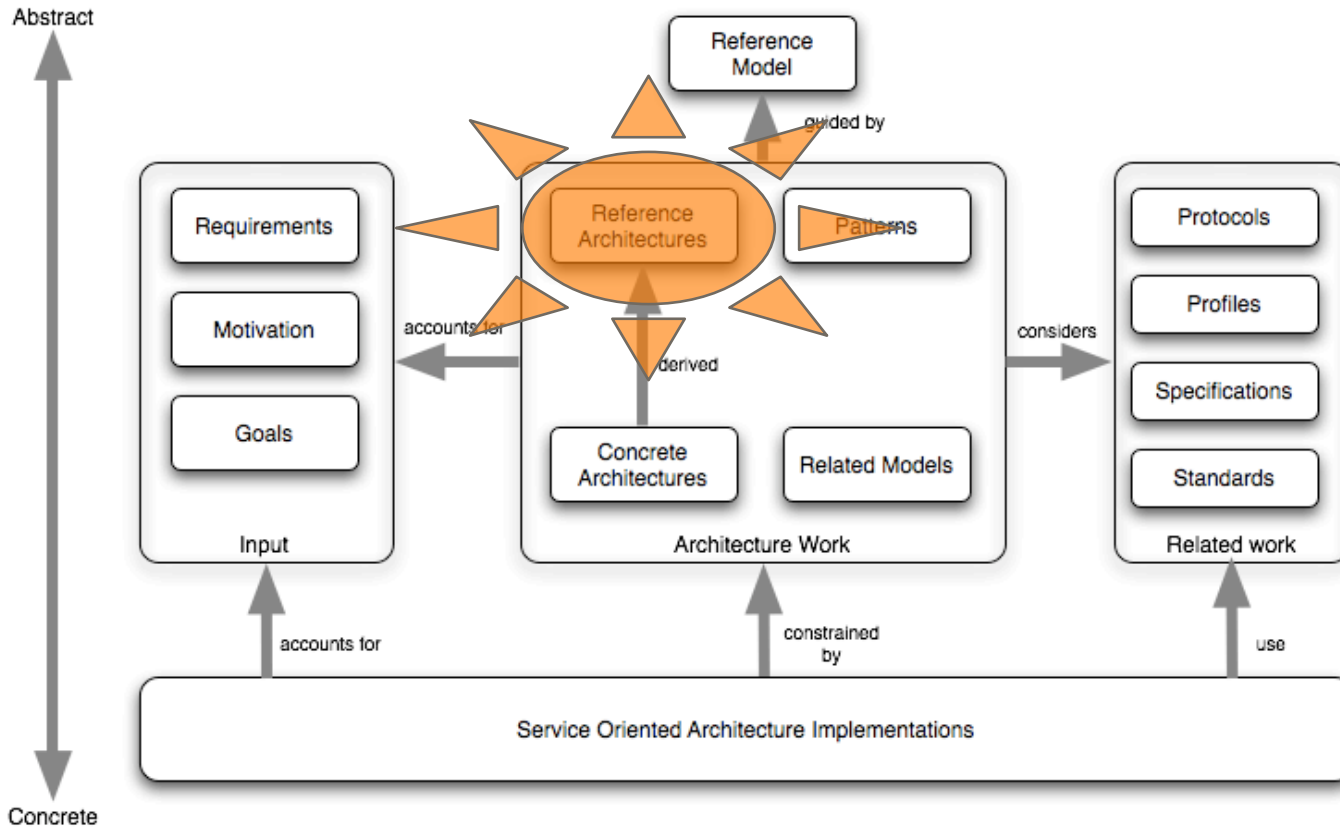
Three Views of SOA

- ## Service Ecosystem
  - ### Captures what SOA means for people conducting their business

- ## Realizing a SOA-based system
  - ### Deals with the requirements for constructing a SOA

- ## Owning a SOA-based system
  - ### What are the issues involved in owning a SOA-based systems

Viewpoint Specifications

Viewpoint Element	Viewpoint		
	Service Ecosystem	*Realizing Service Oriented Architectures*	*Owning Service Oriented Architecture*
Main Concepts	Captures what SOA means for people using it to conduct business.	Deals with the requirements for constructing a SOA.	Addresses issues involved in owning and managing a SOA.
Stakeholders	People (using SOA), Decision Makers, Enterprise Architects, Standards Architects and Analysts.	Standards Architects, Enterprise Architects, Business Analysts, Decision Makers.	Service Providers, Service Consumers, Enterprise Architects, Decision Makers.
Concerns	Conduct business safely and effectively.	Effective construction of SOA-based systems.	Processes for engaging in a SOA are effective, equitable, and assured.
Modeling Techniques	UML class diagrams	UML class, sequence,, component, activity, communication, and composite structure diagrams	UML class and communication diagrams

Service Ecosystem View

- Acting in a Social Context
- What does it mean to be part of a SOA
- Ownership

Lay the foundation for securely and effectively participating in a SOA ecosystem
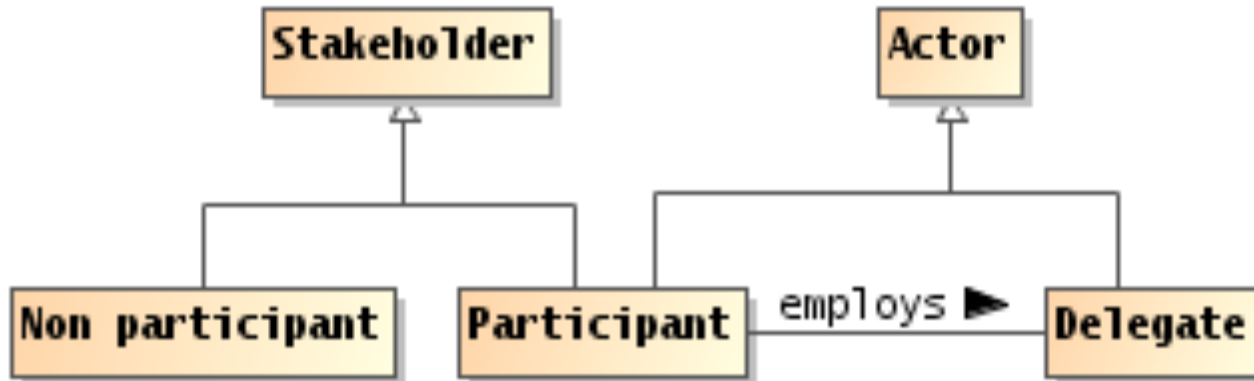
Acting in a Social Context
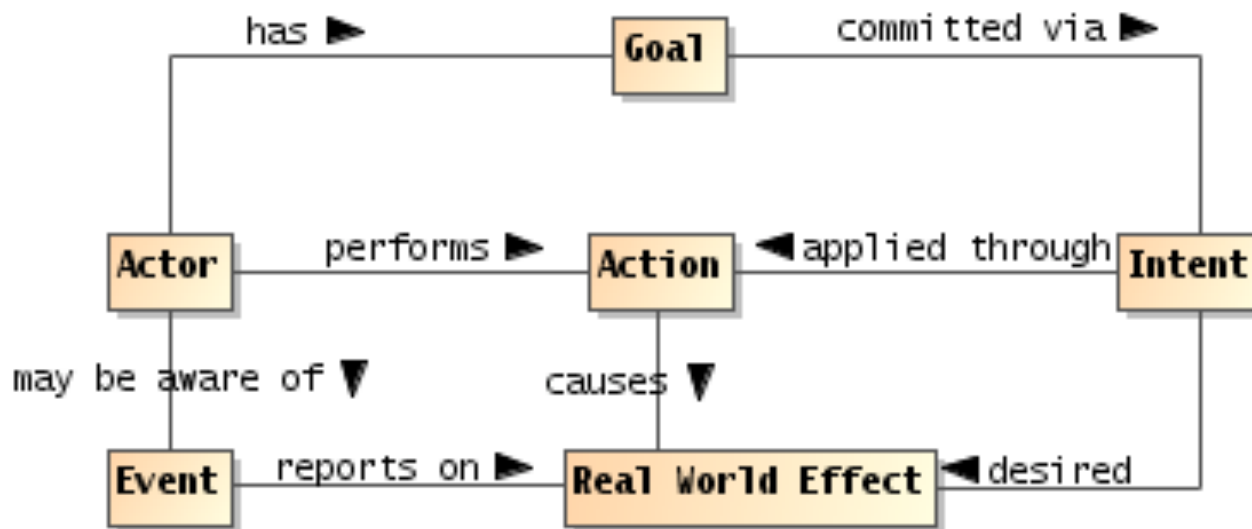
Action is the application of intent by an actor to achieve a real world effect

An *actor* is an entity that is capable of action

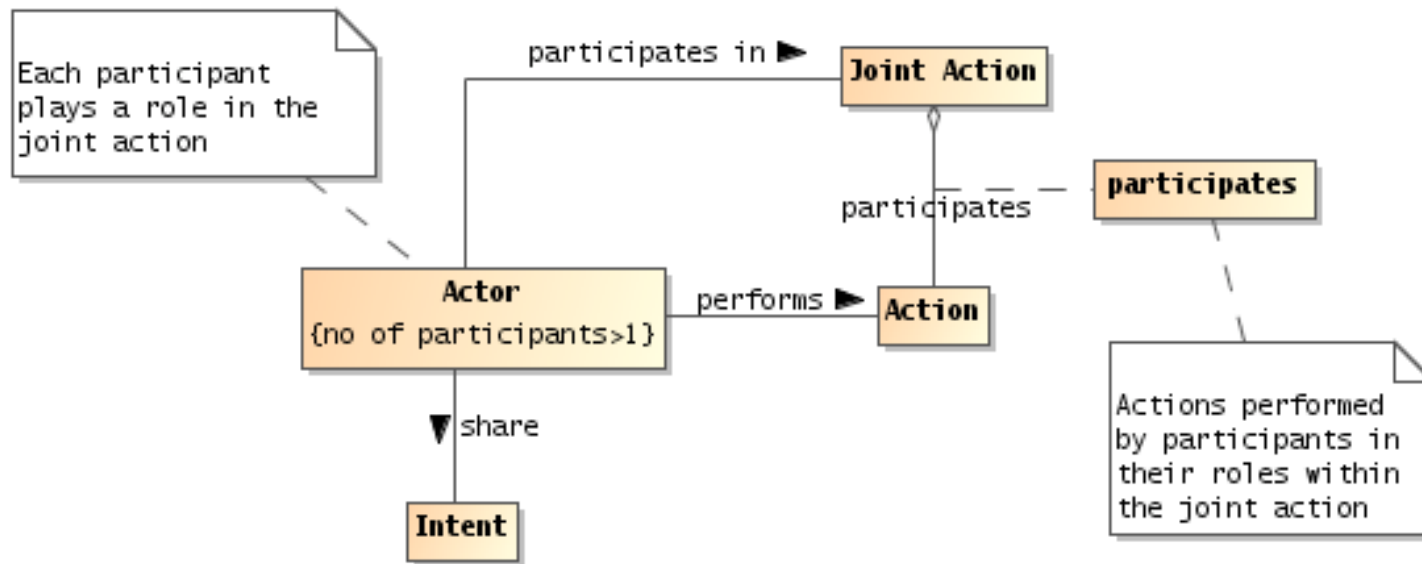A *goal* is a measurable state of the world that an actor is seeking to establish

A *Real World Effect* is the actual result of performing an action

Actors, Participants and Delegates

*A **delegate** is an actor that is acting on behalf of a person or organization*

Joint Action

Each participant plays a role in the joint action

participates in ▶ Joint Action

participates

participates

Actor
{no of participants>1}

performs ▶ Action

Actions performed by participants in their roles within the joint action

▼ share

Intent

*A **joint action** is an action involving the efforts of two or more actors to achieve a real world effect*

Communication as Action
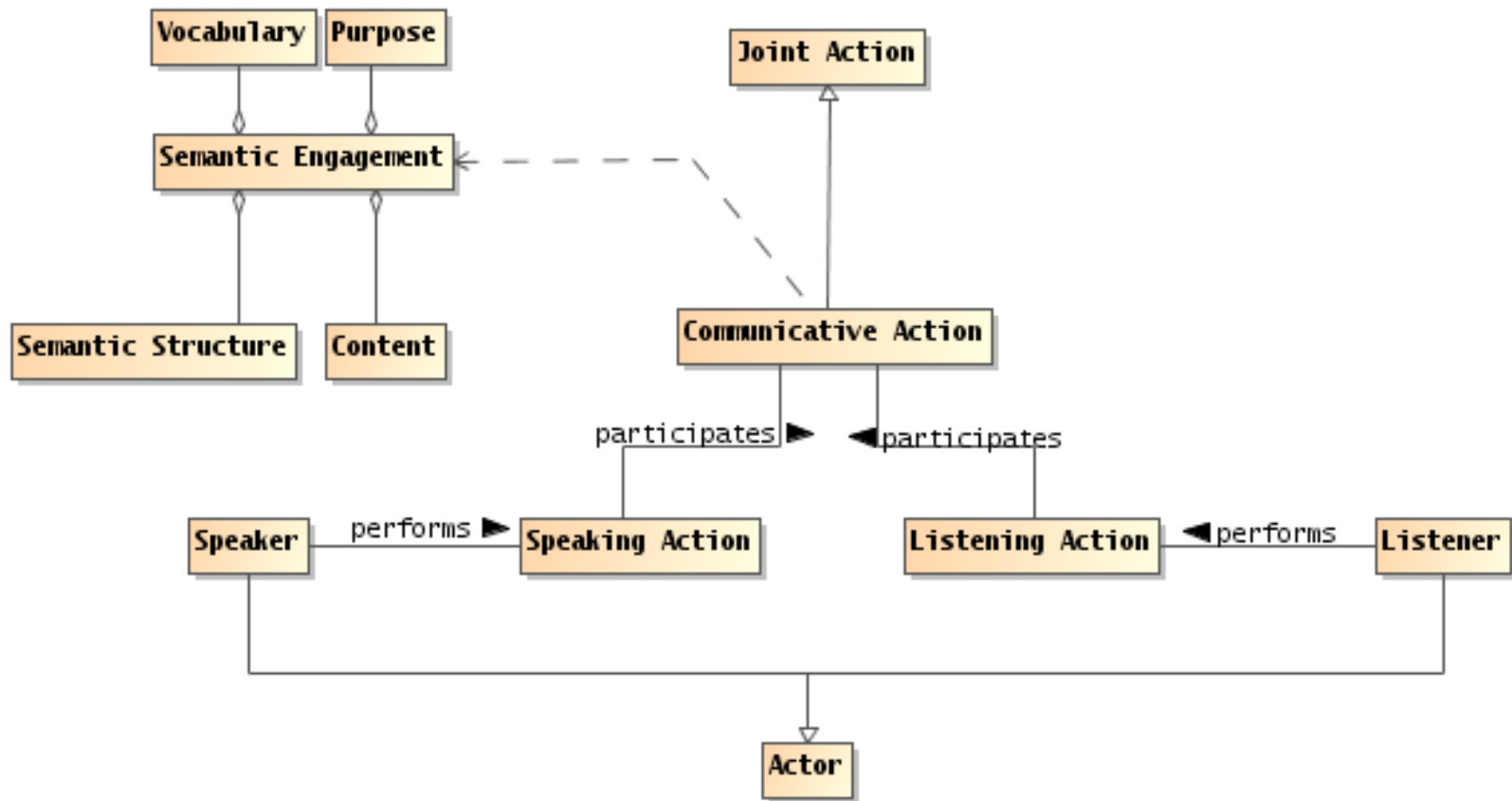
Communicative actions are joint actions where actors communicate with each other.

Using Communication for Service
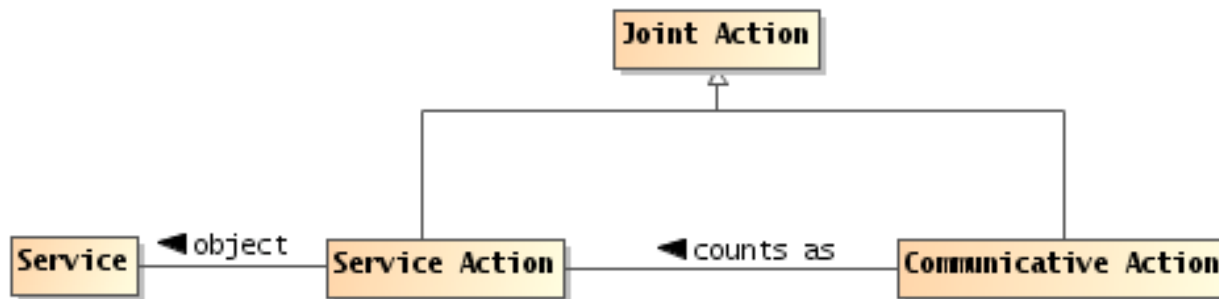
A Service action is simply an action whose object is a service

*'**Counts as**' is a relationship between two systems in which one action, event or concept in one system can be understood as another action, event or concept in another system.*

Social Structure
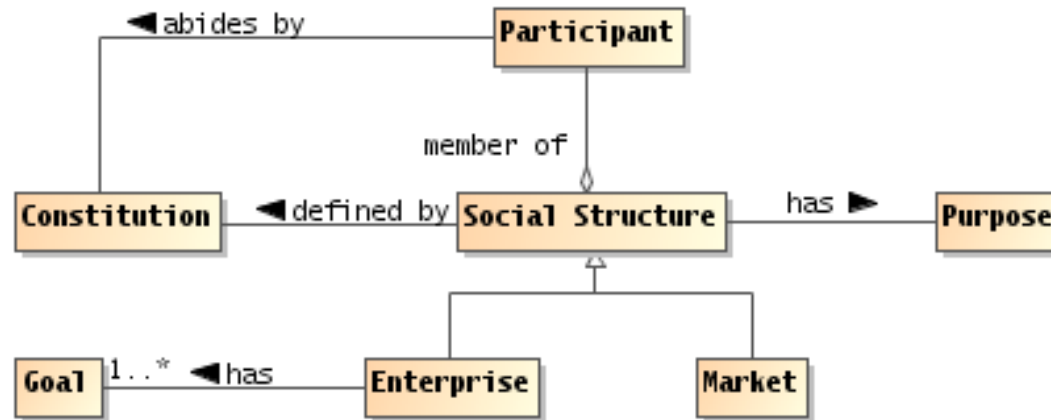
*A **social structure** embodies some of the cultural aspects that characterize the relationships and actions among a group of participants.*

*An **enterprise** is a social structure which is associated with internal goals.*
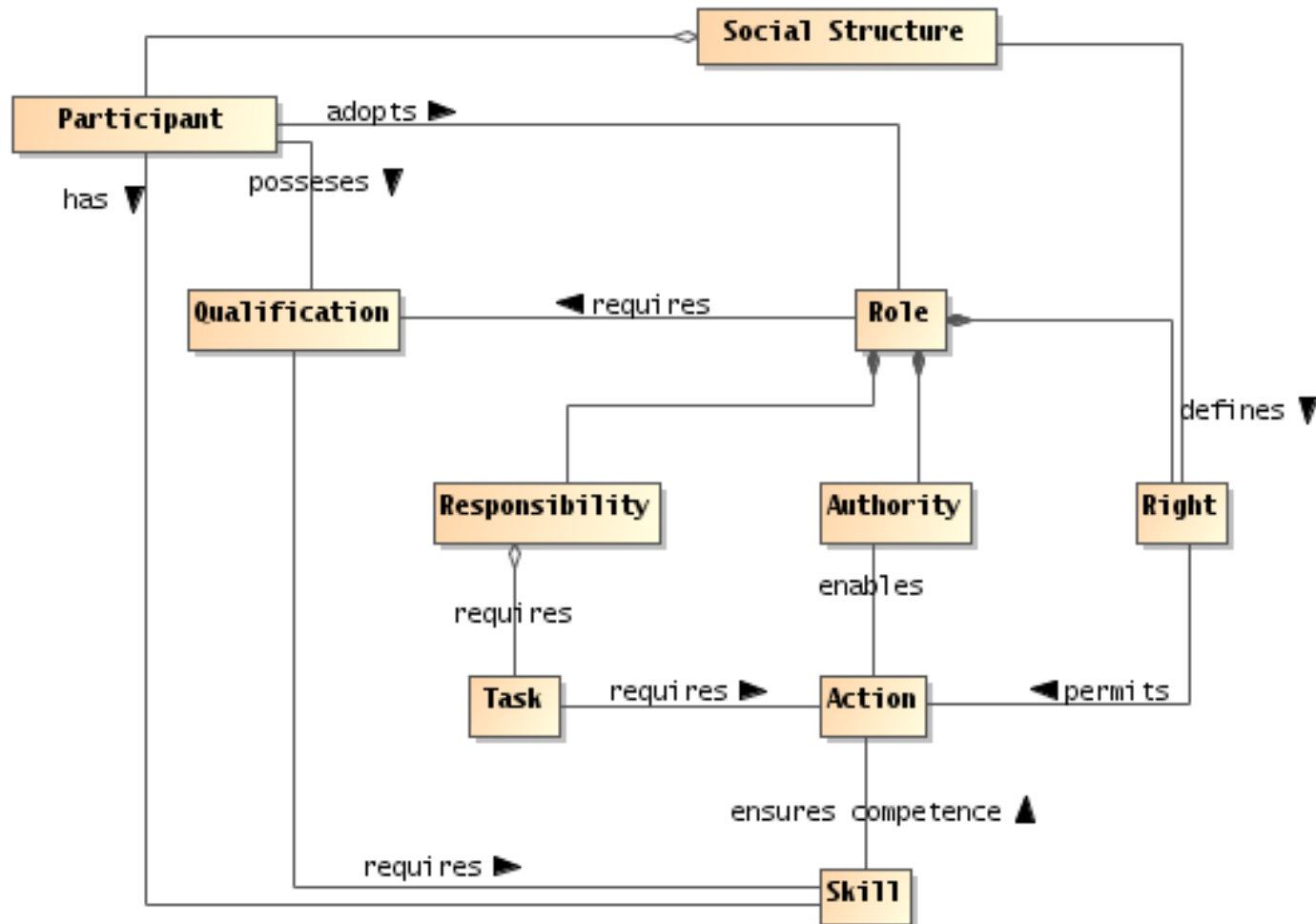
*A **market** is a social structure which enables participant to exchange value for their mutual benefit.*
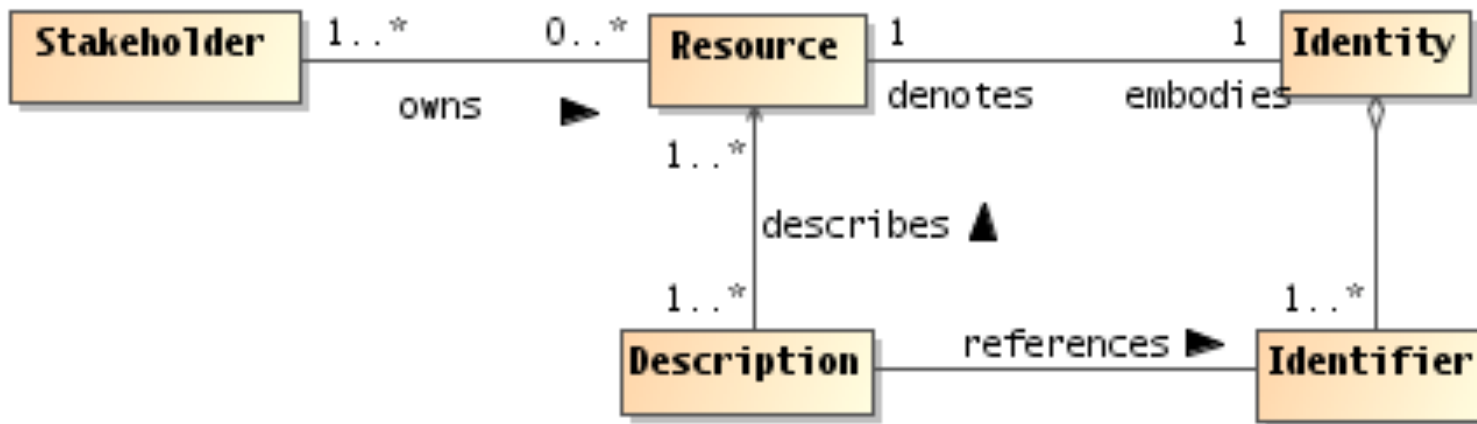
Stakeholders and Participants
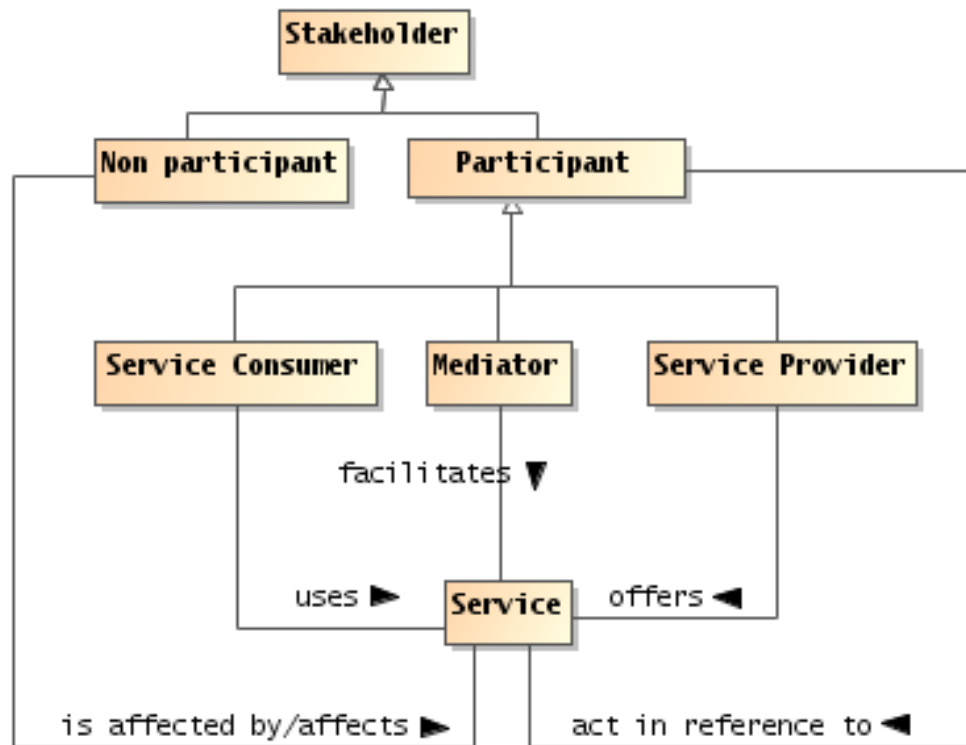
*A **stakeholder** is an individual entity, human or non-human, or organization of entities that has an interest in the states of participants and/or the outcomes of service interactions*
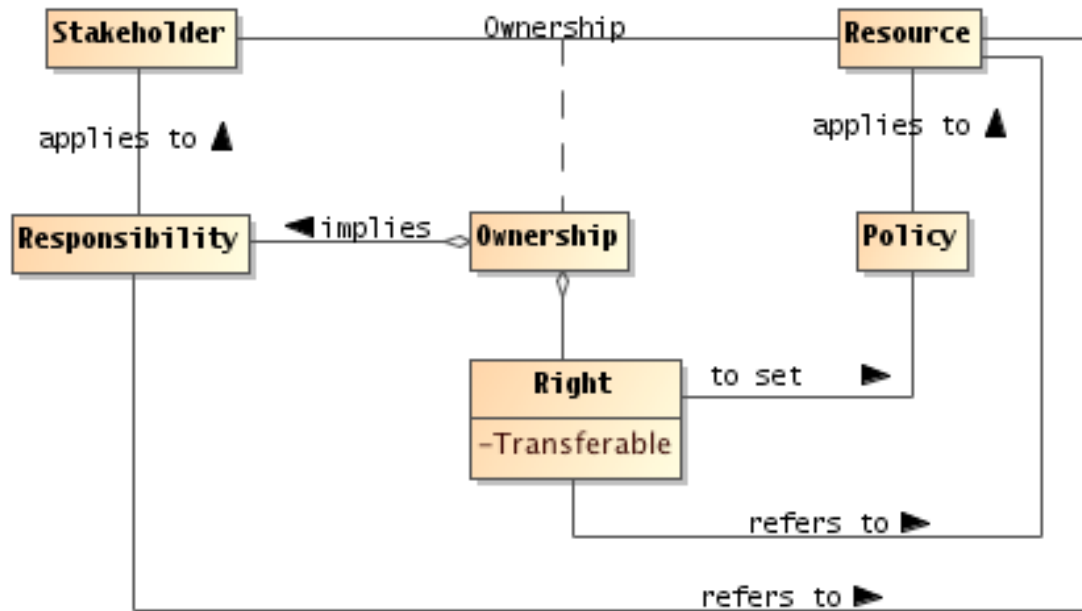
Roles, Rights and Responsibilities

Resources

*A **resource** is any entity of some perceived value, where the value may be in the function it performs or something intrinsic in its nature*
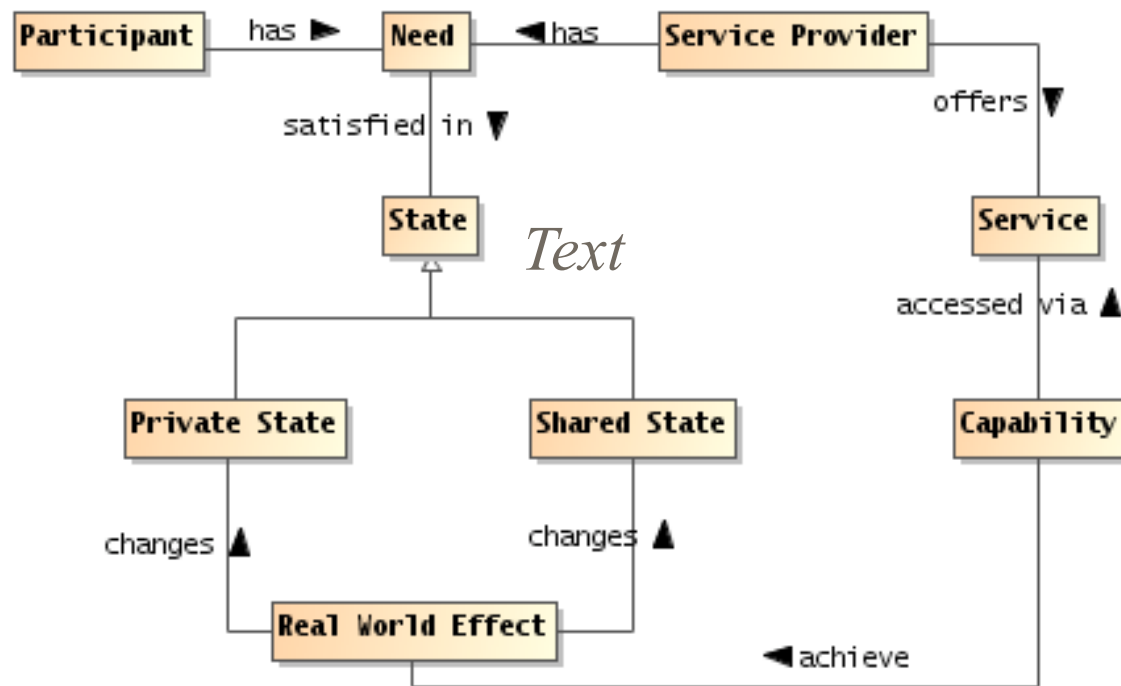
Ownership

Ownership is a relationship between the owning entity, a resource and a set of rights and responsibilities.
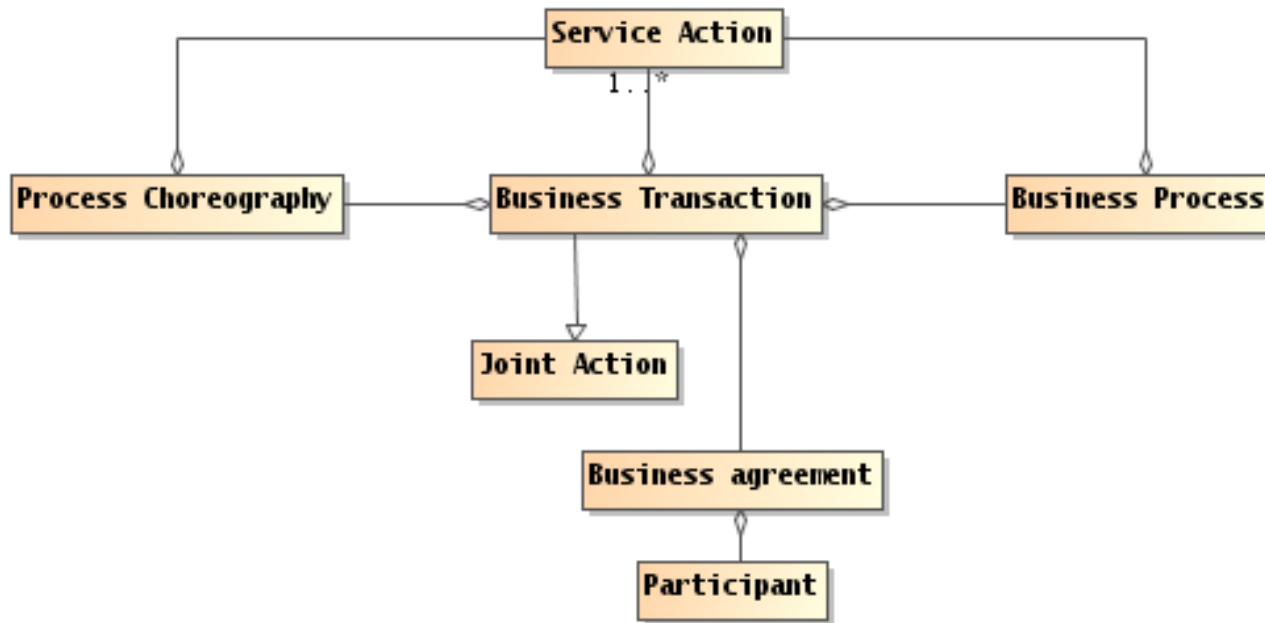
An exclusive right of ownership is the transfer of ownership to another entity

Needs and Capabilities

*A **Service** is a mechanism to enable access to one or more capabilities, where the access is provided using a prescribed interface specified by the service description.*

Transactions and Exchanges

*A **business transaction** is a joint action engaged in by two or more participants in which the real world effect is an increase in apparent value to the participants*
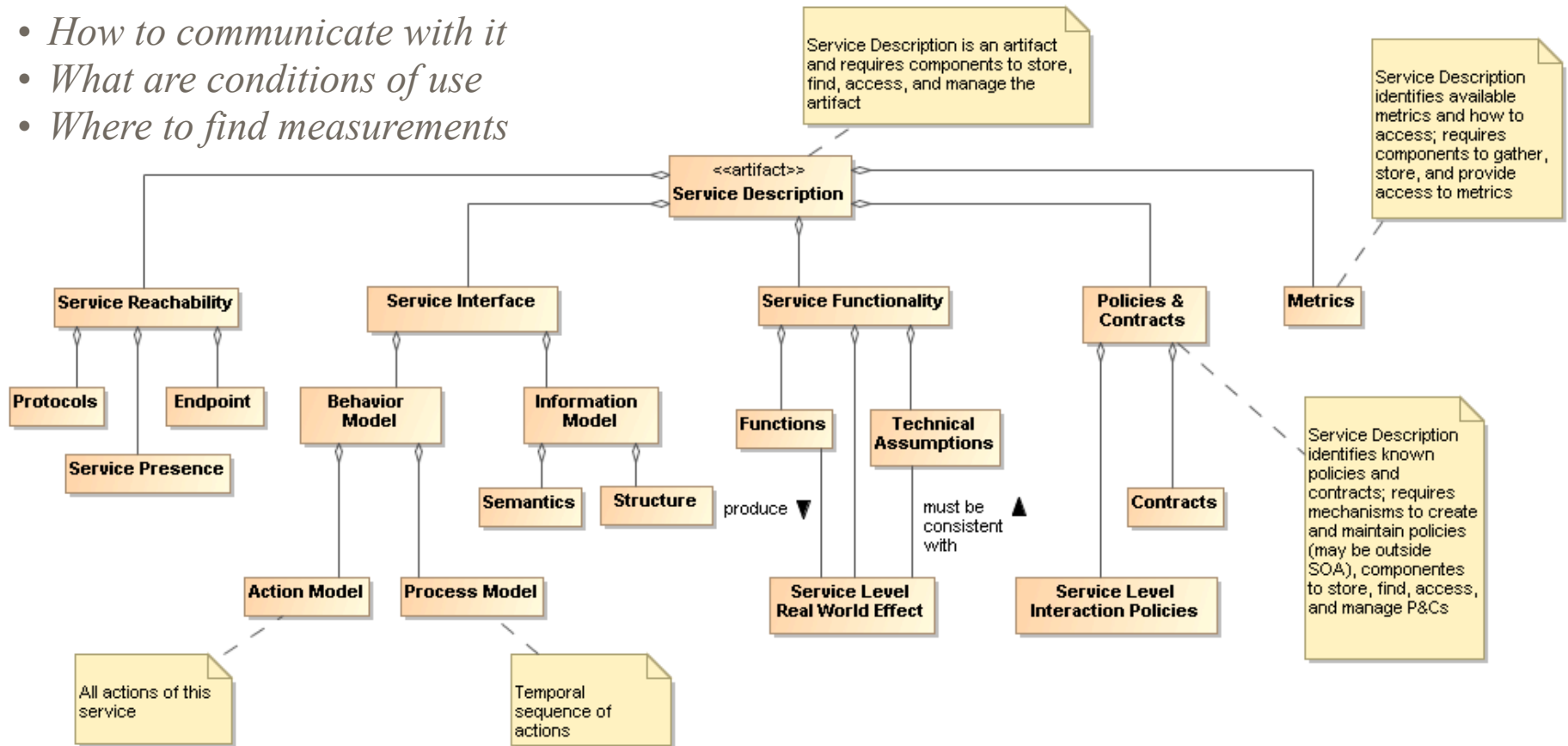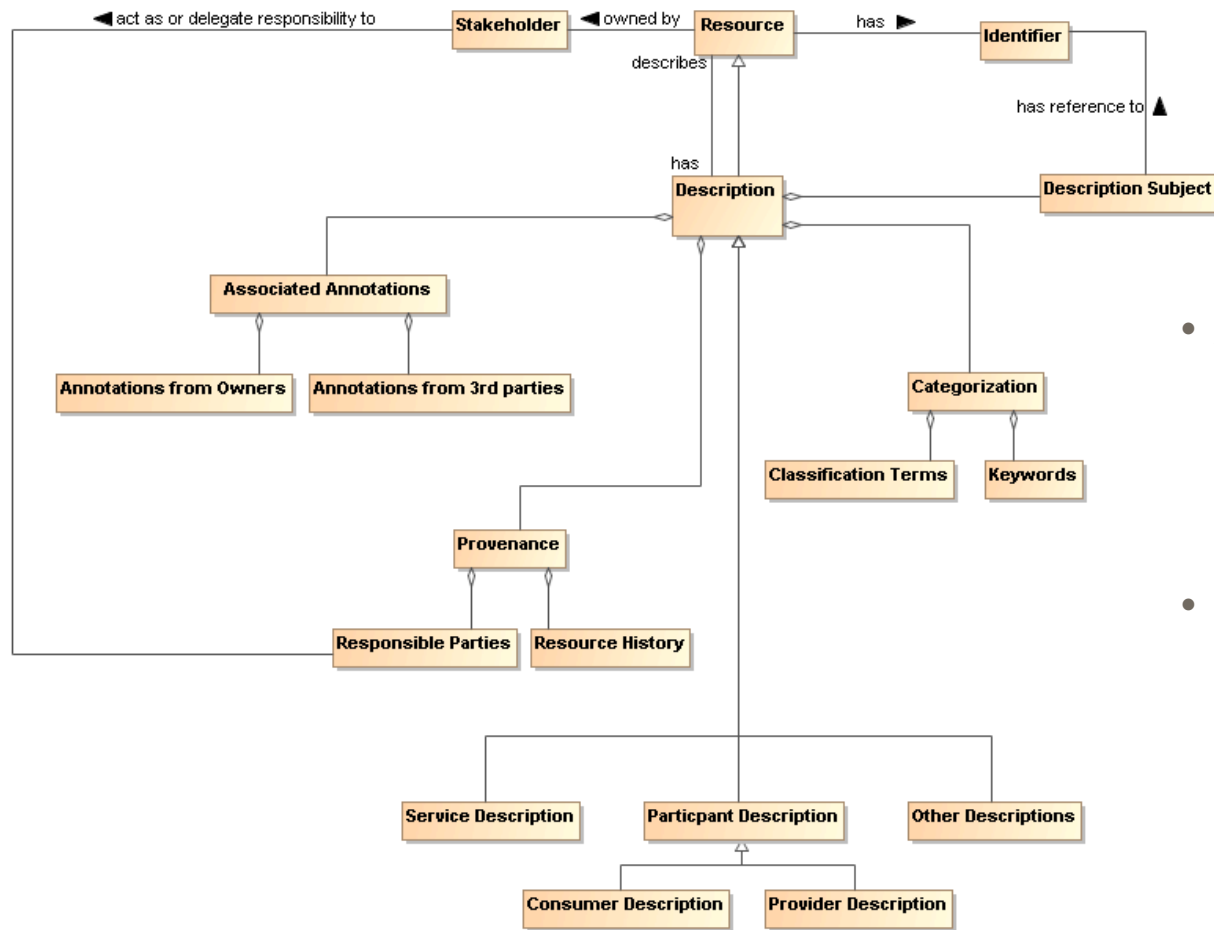
Realizing SOAs View
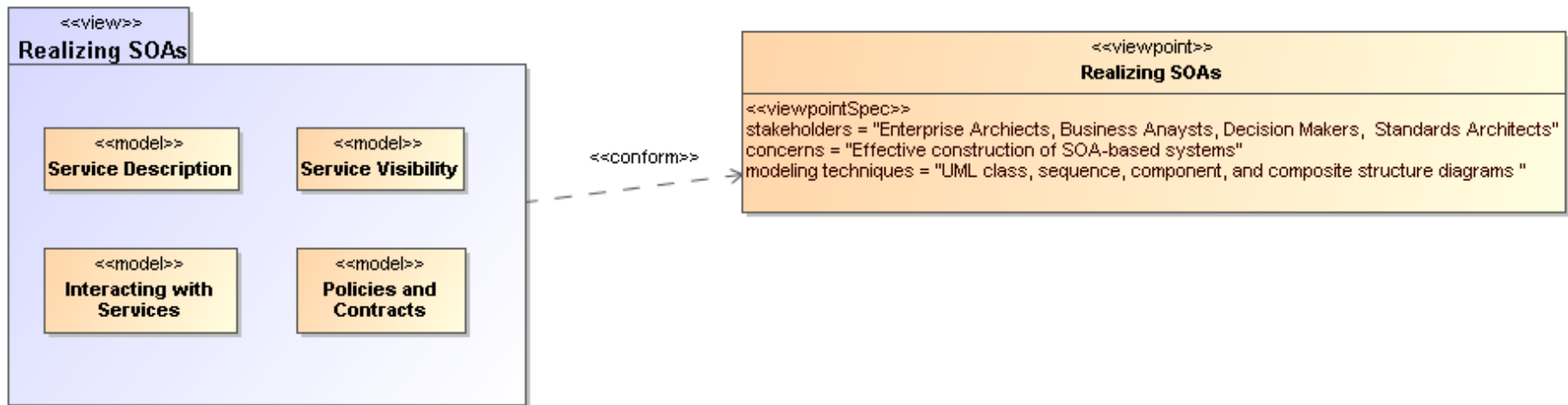
- Descriptions
- Interaction
- Policy Mechanisms

Service Description Model

- *What it does*
- *How to access it*
- *How to communicate with it*
- *What are conditions of use*
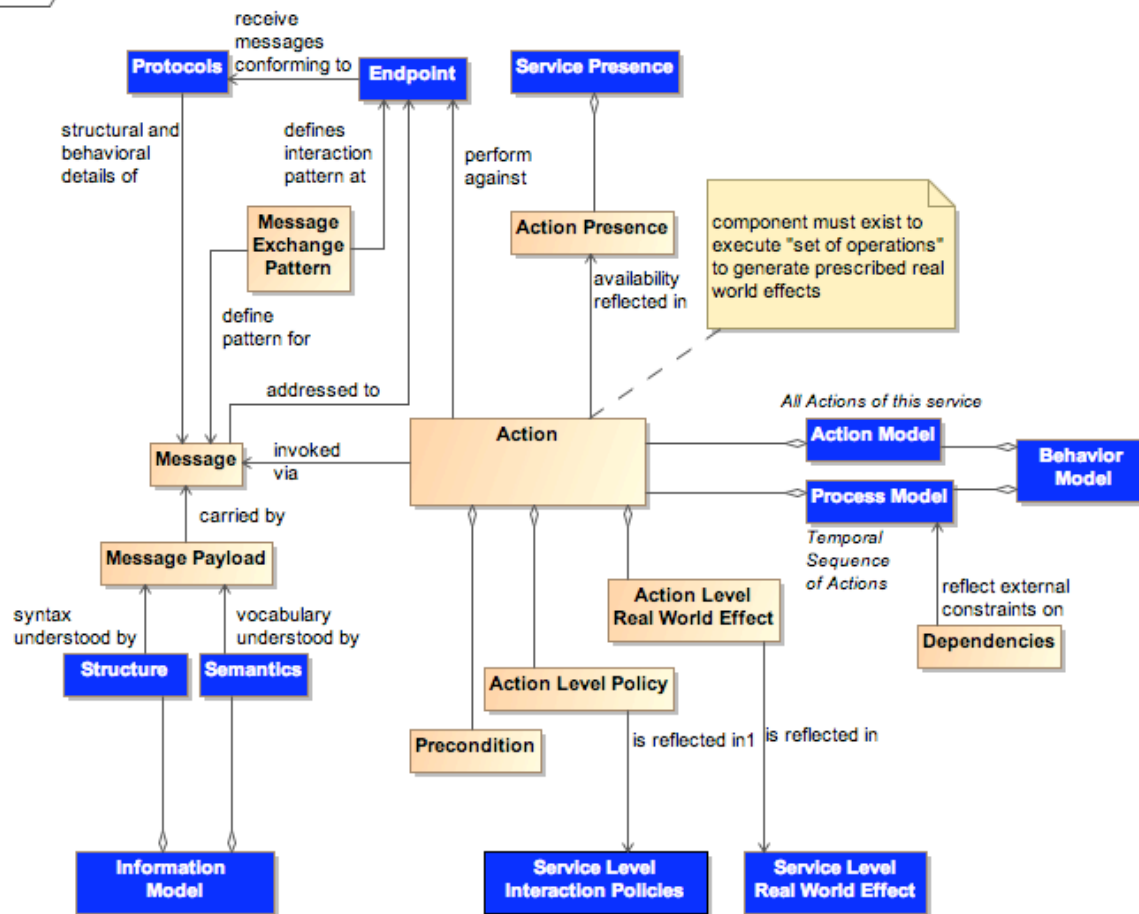- *Where to find measurements*

General Description Model

- *Everything that is part of the SOA ecosystem can benefit from description*

- *Some things, like service, require description for the SOA paradigm to work*
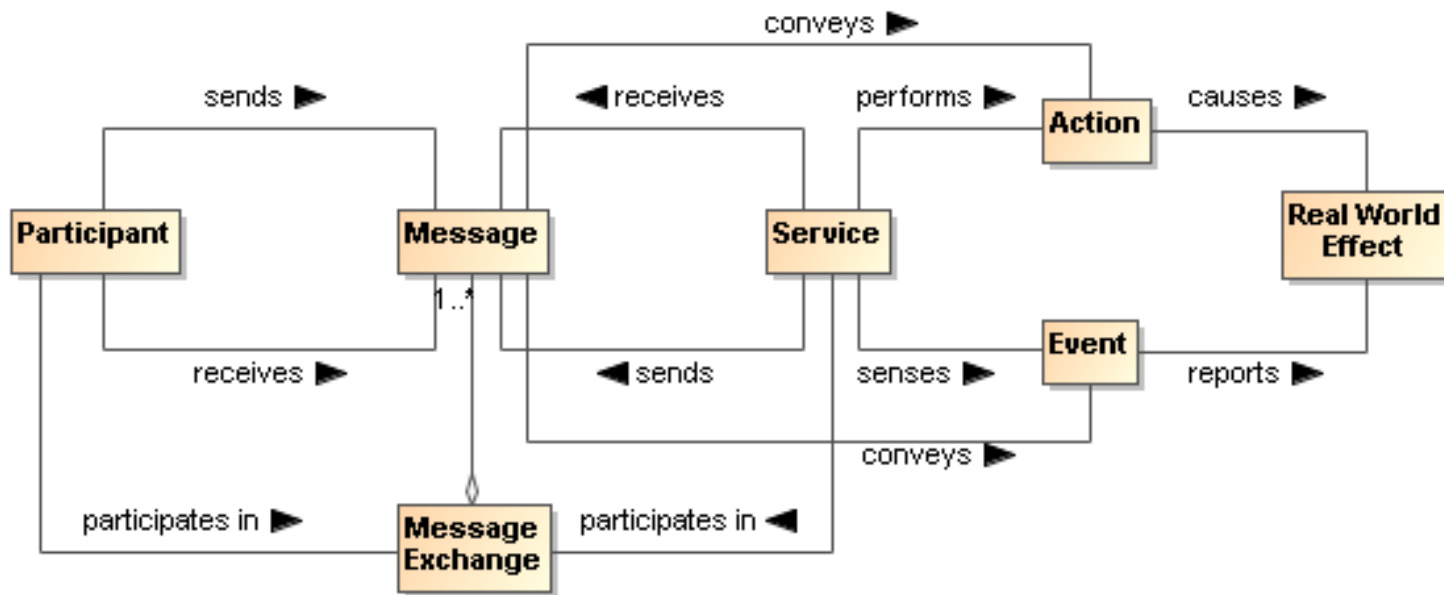
Service Description and Action Relationship

- *Blue are leaf nodes in Service Description*

- *Service Description is more than an incidental artifact*

- *Service Description as integral information that comes together to get things done*
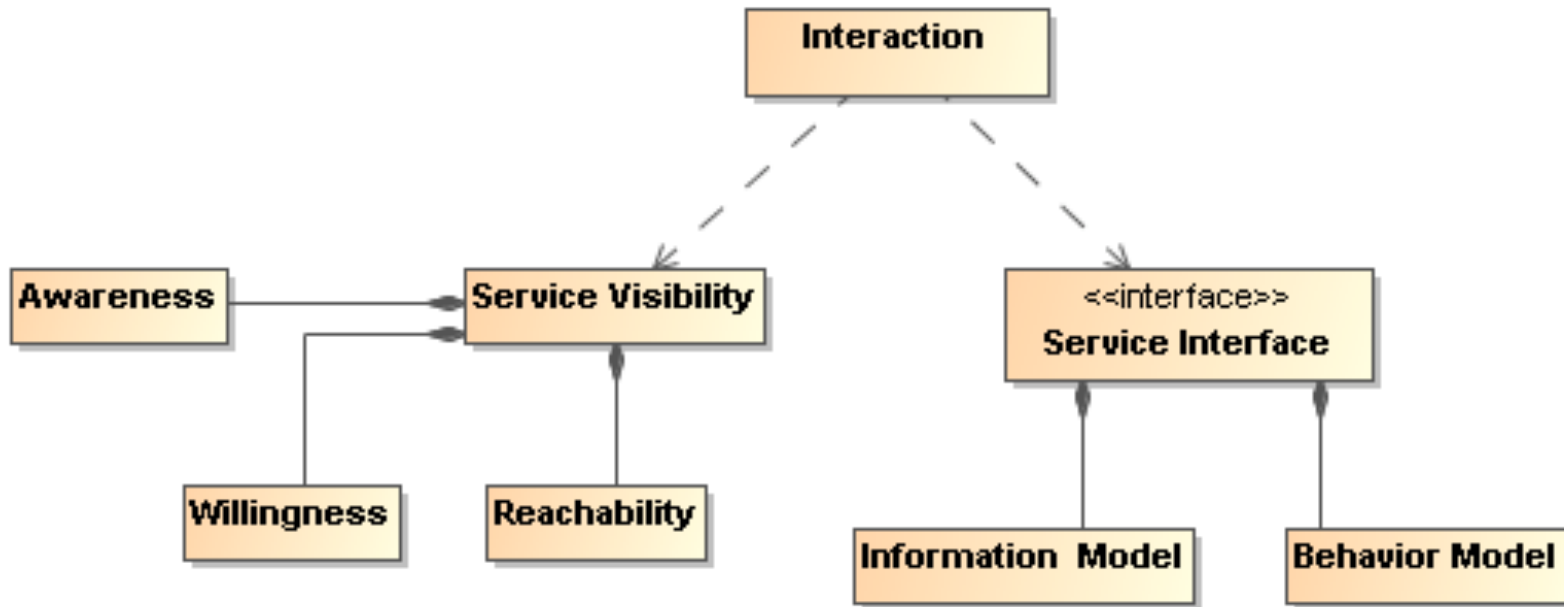
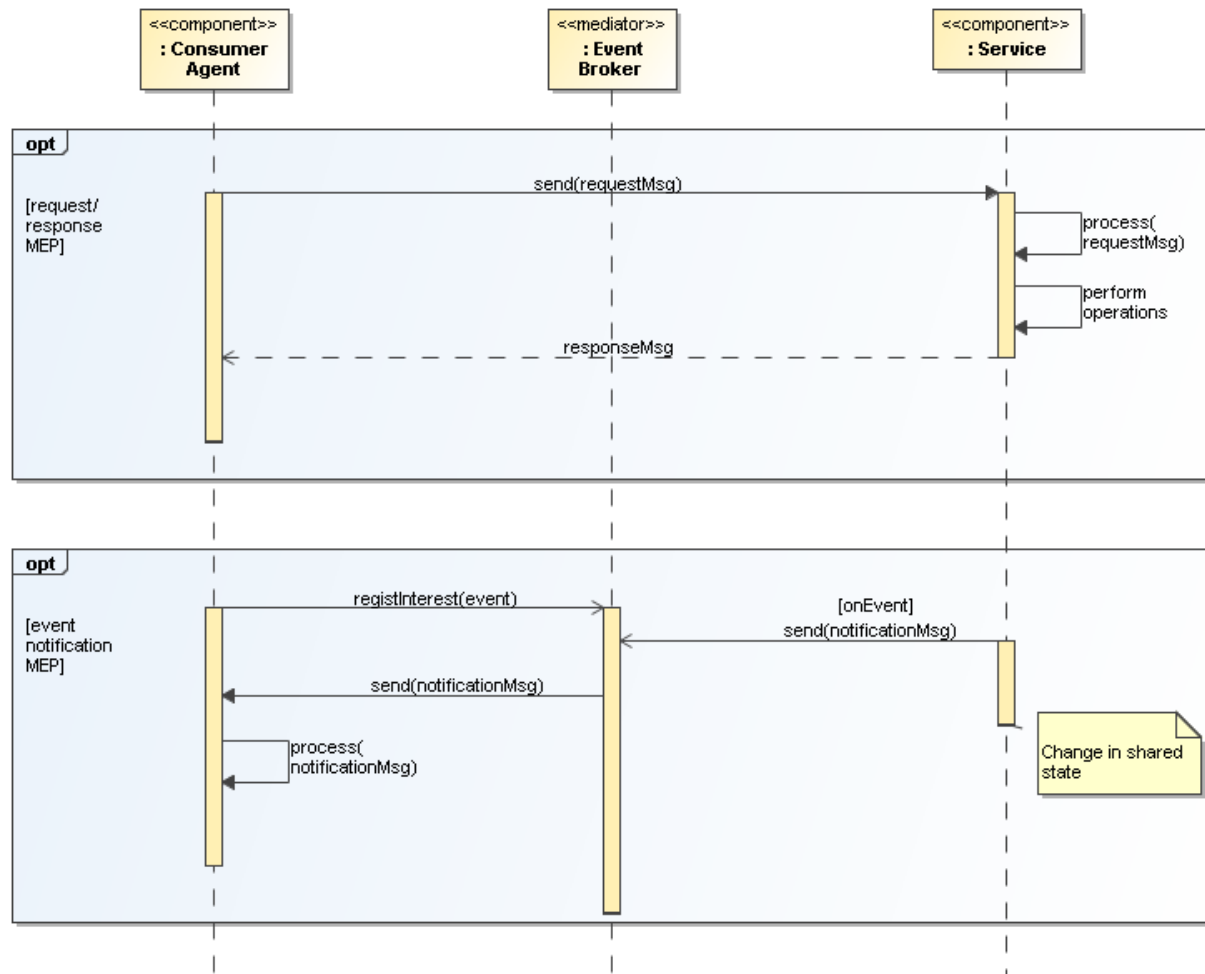# Interacting with Services

Message exchange is the means by which service participants (or their agents) interact with each other

A message conveys either an action or an event

Interaction Dependencies

Message Exchange Patterns (MEPs)

Service-Oriented Business Processes

- Service orientation as applied to business processes (i.e., "service-oriented business processes") means that the aggregation or composition of all of the abstracted activities, flows, and rules that govern a business process can themselves be abstracted as a service

- Typically use a technique known as *orchestration* to compose hierarchical and self-contained service-oriented business processes that are executed and coordinated by a single agent acting in a "conductor" role

Service-Oriented Business Collaborations

- Service orientation as applied to business collaborations (i.e., "service-oriented business collaborations") means that the aggregation or composition of all of the abstracted activities, flows, and rules that govern a business collaboration (peer style interaction) can themselves be abstracted as a service

- Typically use a technique known as *choreography* to characterize and to compose service-oriented business collaborations based on ordered message exchanges between peer entities in order to achieve a common business goal

Owning SOAs View
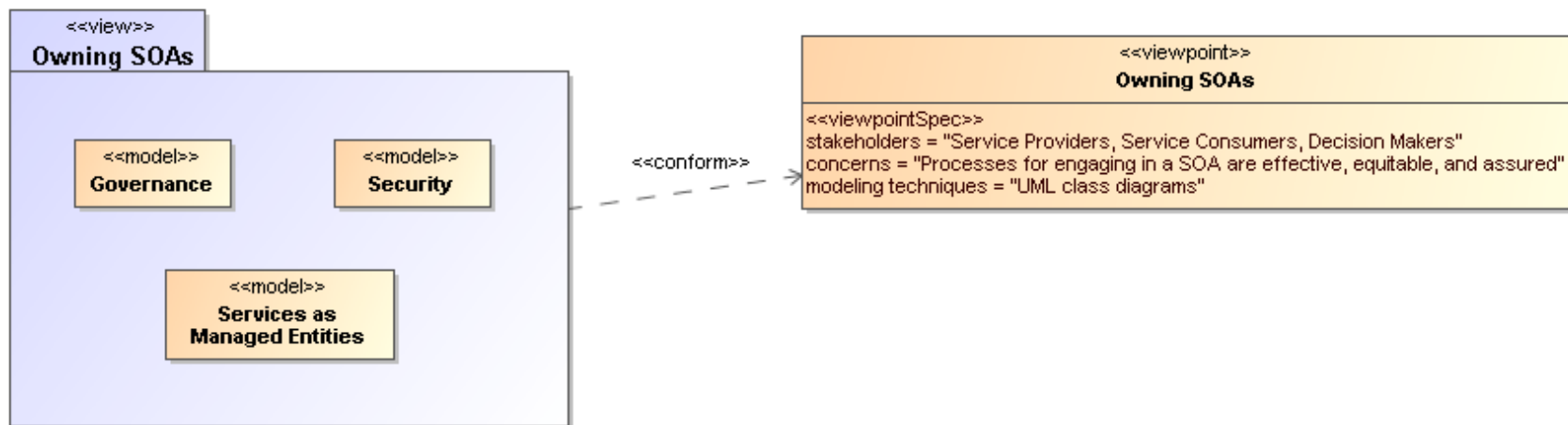
- Governance of SOA Ecosystems
- Security in a SOA ecosystem
- Management of SOA ecosystems

Owning SOA-based systems

- Focus on functions required in achieve value for the enterprise by owning a SOA-based system
- Significantly different challenges to owning other complex systems -- such as Enterprise suites
- Strong limits on the control and authority of any one party when a system spans multiple ownership domains
- Applicable when multiple internal stakeholders involved and no simple hierarchy of control and management

Governance of SOA-based systems

- Governance about how decisions are made
- Management is about how decisions are realized
- Nested – management at one level is governance at another

How SOA Governance is Different

- SOA governance is organization of services that
  - promotes their visibility
  - facilitates interaction among service participants
  - enforces that the results of service interactions are
    - those real world effects as described within the service description
    - constrained by policies and contracts as assembled in the execution context
- SOA governance must specifically account for control across different ownership domains
  - All the participants may not be under the jurisdiction of a single governance authority
  - Participants must agree to recognize authority of the Governance Body, operate within the Governance Framework and through the Governance Processes
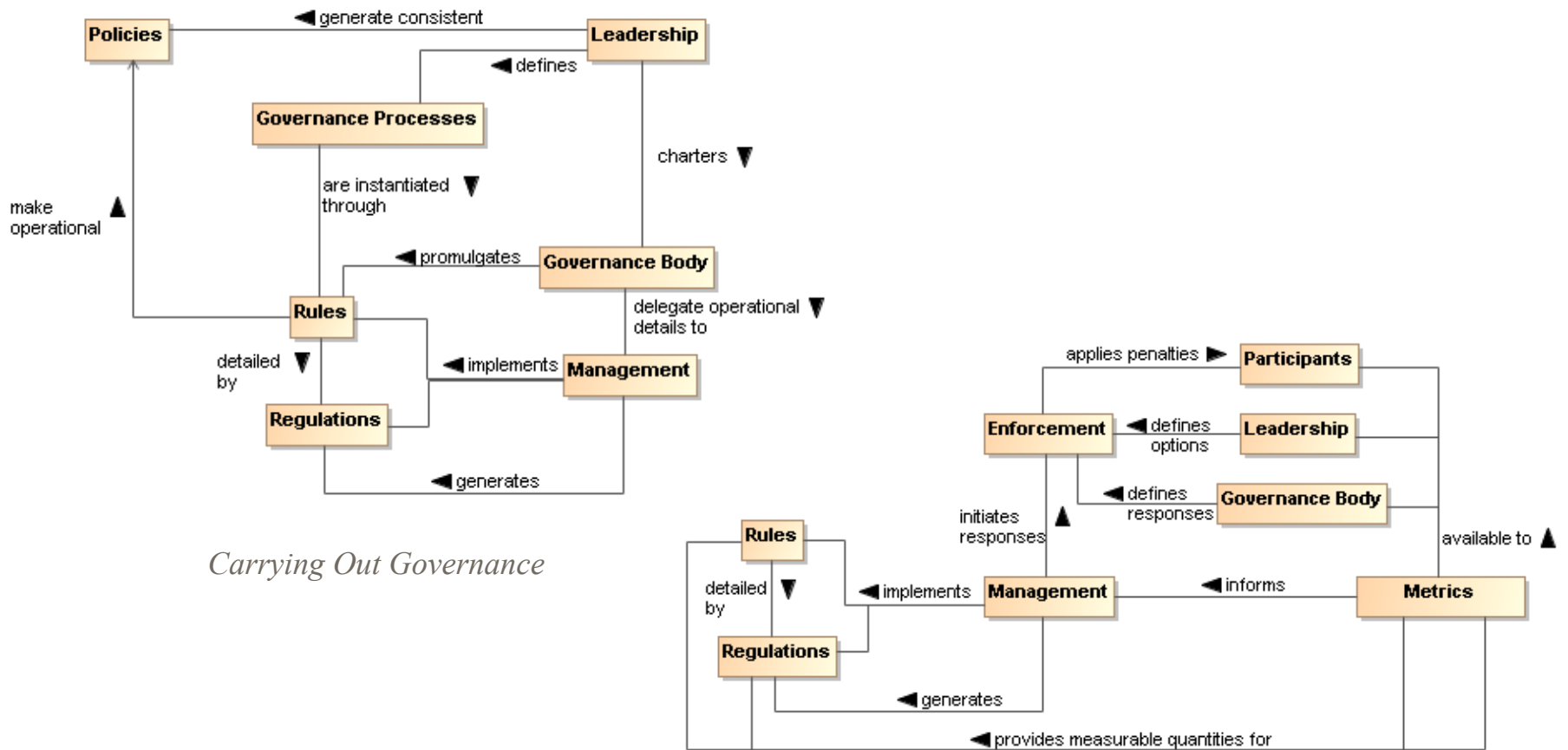
SOA Governance Model (1)
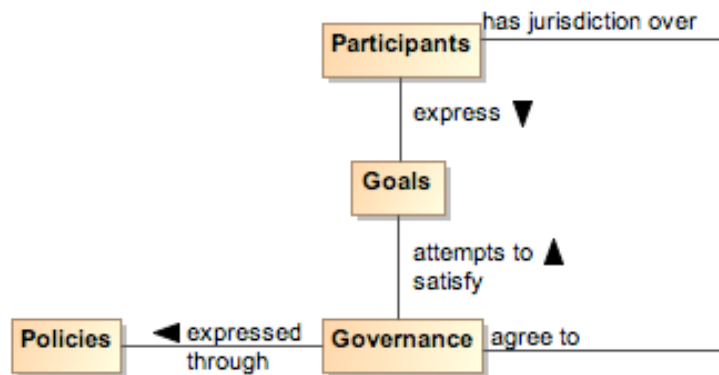
Motivating Governance
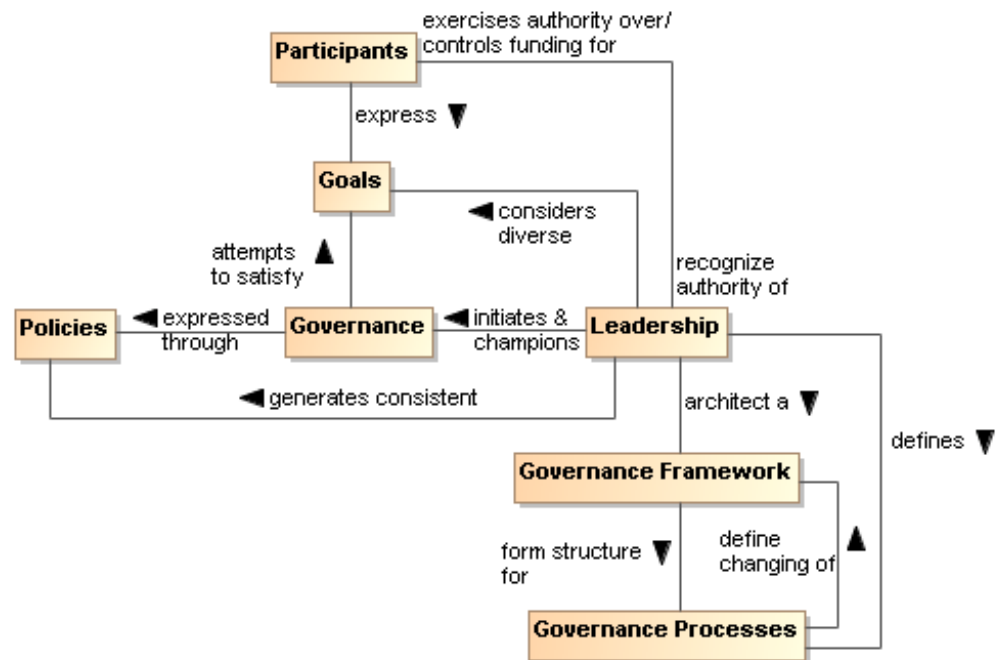
Setting Up Governance

SOA governance builds off general governance concepts

SOA Governance Model (2)

Carrying Out Governance

Ensuring Governance Compliance

Security

- **Security Concepts**
  - e.g., Confidentiality, ..., Availability
- **Trust Model**
  - e.g., Trusted Actions, Trust Domain, Security Policy Mechanisms
- **Security Layers**
  - e.g., Network, Transport, Application
- **Security Threat/Response Model**
  - e.g. Risk analysis and threat mitigation
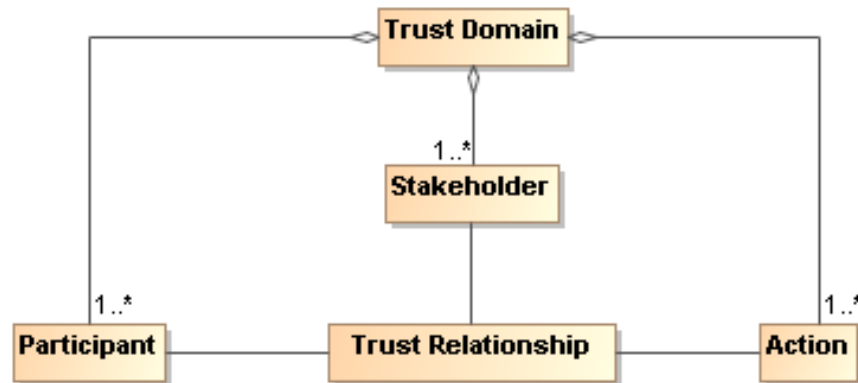
Where SOA Security is Different

- Flexible and dynamically secure computing interactions in support of a computing ecosystem with multiple governance domains

- Greater degree of distributed mechanisms

- Additional auditing and reporting for regulatory compliance
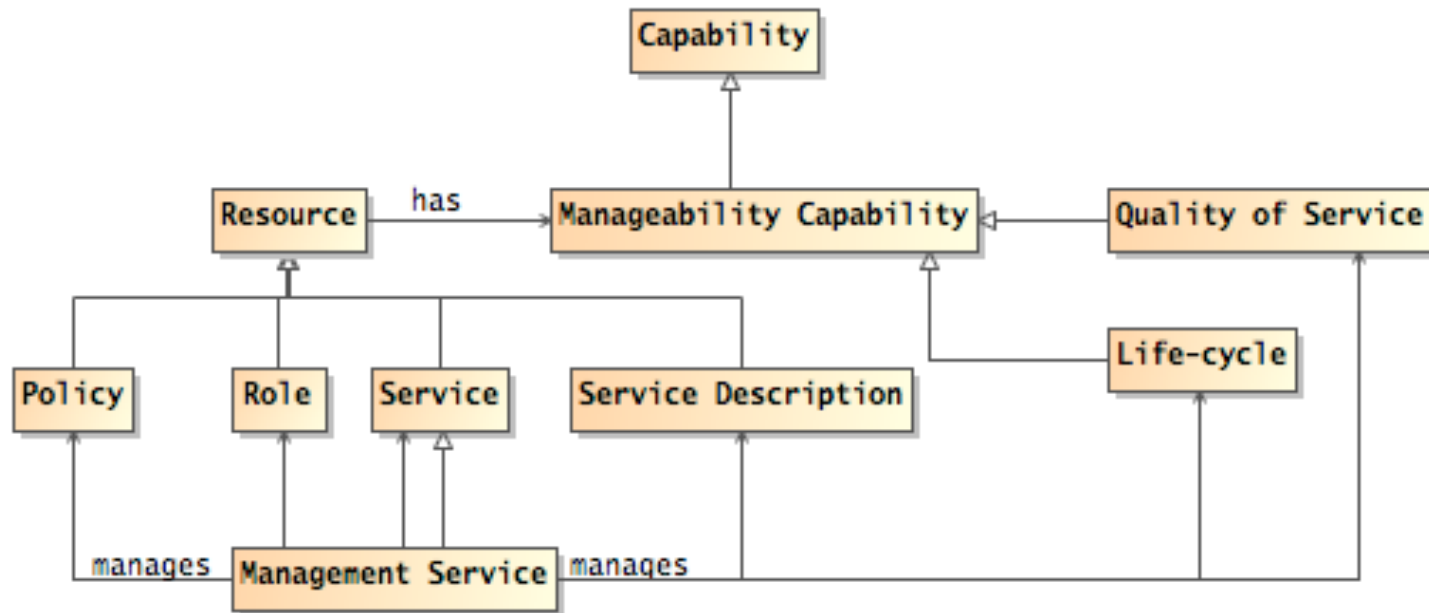
Trust Model
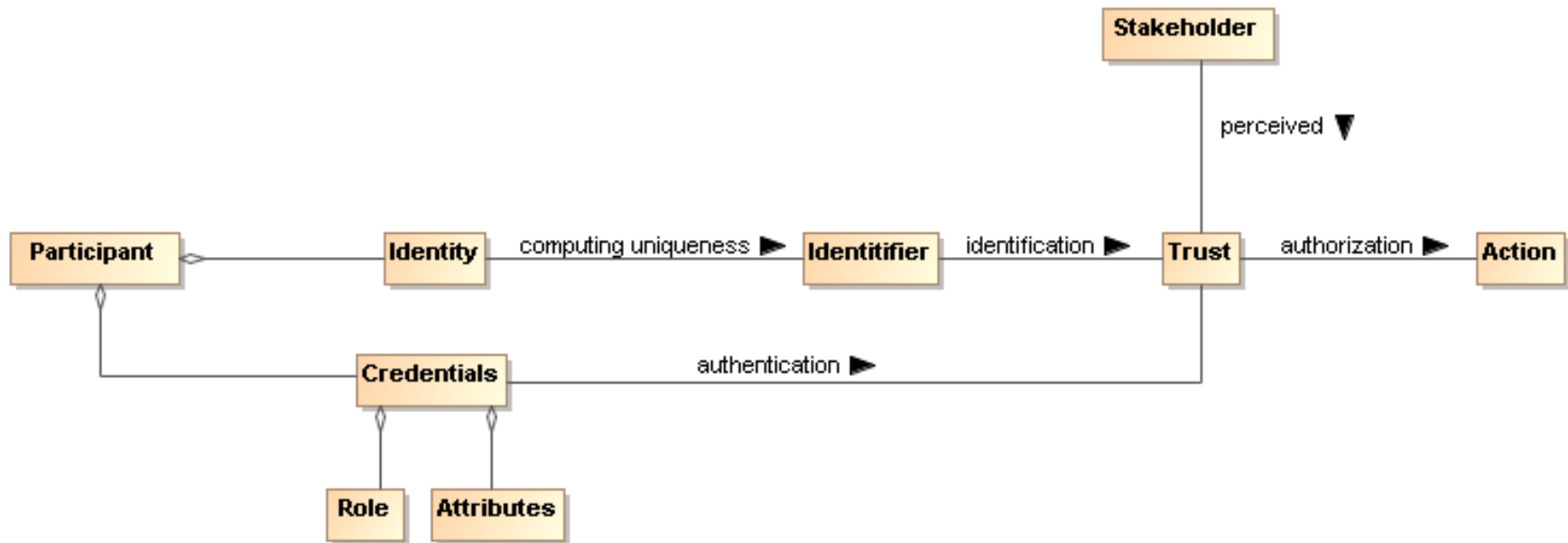
Trust Domain

- Policy-based security must support multiple trust domains

Management

Management of Services rather than simply IT Management

Where we are

* Been active since May 2006
  * Most of the material is in place
  * 100+ page document
* Issued first OASIS Public Review in early May
* Emphasis on the relationship between people and the systems they live with

Special Thanks

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Comments and Questions?