SOA MDA and SoaML
Introduction

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(see references page at the end)
Service oriented architecture Modeling Language (SoaML) - Specification for the UML Profile and Metamodel for Services (UPMS)

OMG Adopted Specification
Finalisation Task Force Beta 2 document (FTF Beta 2)

OMG Document Number: ptc/2009-12-09
Associated File(s)*: http://www.omg.org/spec/SoaML/20091101
Plan for SoaML lectures

• Now: Introduction to MDD of SOA, and the role of SoaML (1 hour)
• 1500-1700 today: SoaML Standard, Process for SoaML-based MDD
**MDD of enterprise SOA**

**Business Concerns**
- Business Model
- Enterprise Services (e-SOA)
- Roles, Collaborations & Interactions
- Process, Information & Rules

**Logical System Model**
- Technology Services (t-SOA), Components, BPM
- Interfaces, Messages & Data

**Technology Specification**
- JMS, JEE, Web Services, .NET
- WS*, BPEL, XML Schema

**MDA Terms**
- Computation Independent Model
- Platform Independent Model
- Platform Specific Model

Refinement & Automation
Line-Of-Sight
MDA Terms

Business Architecture Model (BAM)

1. Business Goals
2. Business Processes
3. Capabilities
4. Services Architecture
5. Service Contracts and Behaviour
6. Model to Model (M2M) Transformation

Software Architecture Model (SAM)

7. Service Interfaces
8. Interfaces and Messages
9. Service Choreographies
10. Software Components
11. Services Orchestration

Platform-Specific Model (PSM)

Cloud, Web Services, JEE, MAS, P2P/Grid, SWS

Computation Independent Model

Platform Independent Model

Platform Specific Model
Process vs. artifacts

SoaML standard does not define any process
Possible process for CIM → PIM

- Refine business goals
- Refine business processes
- Specify capabilities
- Specify services architecture
- Specify service contracts
- Specify service choreographies

Other

SoaML
Linking business to IT architecture

BMM

To make the portability as much transparent as possible to the customer

To provide mobile phone number portability

<<part>>

To provide mobile services portability

<<part>>

SoaML (starts here)

BPMN

Check whether number porting is possible

Calculate costs

Issue bill

Receive money

Execute number porting

BMM

SoaML (starts here)
Linking IT architecture to IT services

Components implement the service interfaces providing the link to systems.

“Ports” on the participating components provide and require the service interfaces for each service provided or used.
Definition of service in SoaML

• “A service is value delivered to another through a well-defined interface and available to a community (which may be the general public). A service results in work provided to one by another.”

• Service Oriented Architecture (SOA) is a way of describing and understanding organizations, communities and systems to maximize agility, scale and interoperability.

• SOA, then, is an architectural paradigm for defining how people, organizations and systems provide and use services to achieve results.

• SoaML provides a standard way to architect and model SOA solutions using the Unified Modeling Language (UML).
SoaML Goals

- **Intuitive and complete** support for modeling services in UML
- Support for **bi-directional asynchronous services** between multiple parties
- Support for **Services Architectures** where parties provide and use multiple services.
- Support for **services defined to contain other services**
- Easily mapped to and made **part of a business process specification**
- **Compatibility with UML, BPDM and BPMN** for business processes
- Direct mapping to web services
- **Top-down, bottom up or meet-in-the-middle modeling**
- **Design by contract** or **dynamic adaptation** of services
- To specify and relate the **service capability and its contract**
- **No changes to UML**
SoaML – Scope

• Extensions to UML2.1 to support the following new modeling capabilities:
  – Identifying services
  – Specifying services
  – Defining service consumers and providers
  – Policies for using and providing services.
  – Defining classification schemes
  – Defining service and service usage requirements and linking them to related OMG metamodels, such as the BMM and BPMN 2.0.

• SoaML focuses on the basic service modelling concepts
  – A foundation for further extensions both related to integration with other OMG metamodels like BPMN 2.0, SBVR, OSM, ODM and others.

• SoaML is NOT a methodology
SoaAML Overview

- SoaAML metamodel and UML Profile
- Service capabilities
- Services, services contracts and service specifications
- Service data
- Services Architecture
- Service Classification
- Unifying collaboration modeling and composite structures
- Milestones
- Integration with other submissions
  - BMM Integration
SoaML – Key concepts

• Services architecture – specification of community
  – Participants – role
  – Service contracts – collaboration (provide and consume)

• Service contract – specification of service
  – Role – Provider and consumer
  – Interfaces
  – Choreography (protocol, behaviour)

• Service interface – bi-directional service

• Simple interface – one-directional service

• Message Type – data exchanged between services
The SoaML Profile

- SoaML is defined as a small set of UML stereotypes.
- These specialize a UML tool for use with SoaML.
- Standard UML can be used as well, as part of a SoaML model.
- Some tools provide enhanced SoaML support.
Current SoaML Support

• OMG Web site

• Known SoaML Tooling
  – Cameo SOA+ (NoMagic) UML with SoaML Modeling and Provisioning
  – ModelPro (ModelDriven.org) Open Source MDA provisioning for SoaML
  – Enterprise Architect (Sparx) SoaML Profile for UML tool
  – Objecteering (Softeam) SoaML Profile for UML Tool
  – RSA (IBM) UML tool with SoaML & code generation [Not yet released]
References

• *Enterprise-SOA with SoaML*, Cory Casanave, Model Driven Solutions

• *SoaML Tutorial, SHAPE FP7 Project*, Arne J. Berre, Brian Elvesaeter, Dima Panfilenko, Andrey Sadovykh