Standard SOA Reference Models and Architectures

The Open Group Perspective
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Welcome to San Diego!
Agenda

- The Open Group’s Standpoint
- The Open Group’s SOA Work
  - Overlap with OASIS and OMG work
- A vision of the future
  - And the value that harmonization can deliver
The Open Group’s Standpoint
The Open Group

- Vendor- and technology-neutral consortium
- Vision of Boundaryless Information Flow™
- Forums and Work Groups
- Consortia and Program Management
- Certification
- The Home of Enterprise Architecture

www.opengroup.org
The Home of Enterprise IT Architecture

- The Open Group Architecture Framework (TOGAF™)
- Certification for architects and for architecture products and services
- The Association of Open Group Enterprise Architects (AOGEA)
Computers Do What They Are Told

\[ a = b \times c \]
People Argue

“My system will give you a 25% return on investment”
## ROI Model

<table>
<thead>
<tr>
<th>Current Sales</th>
<th>Cost of System</th>
<th>Sales Next Year</th>
<th>Return</th>
</tr>
</thead>
<tbody>
<tr>
<td>$25,000</td>
<td>$100,000</td>
<td>$50,000</td>
<td>25%</td>
</tr>
</tbody>
</table>
ROI Reference Model

ROI = \frac{\text{Increase in revenue}}{\text{Development Cost} \times 100}
How Architects Use Models

Reference Model

Model

Implementation specification

Discussion of stakeholder concerns

View
SOA-Related Models

- Service/Applications Matrix
- Service/Technology Matrix
- Technology Portfolio
- Business Process/Service Matrix
- Service Interaction Model
- Service Loading Model
- Business Roles Catalog
- Service Consumers Matrix
- Service Access Control Model
- Service Configuration and Provisioning Model
- Service/Physical System Matrix
- Business Vocabulary
- SOA Governance Model
The Open Group’s Standpoint

Business owner
System user
Product vendor
System manager
Architect
Product designer
Developer
Service provider
Integrator
The Open Group’s SOA Work
SOA Meets EA
The SOA Working Group

- Develops and fosters common understanding of SOA in order to facilitate alignment between the business and information technology communities.
- By conducting producing definitions, analyses, recommendations, reference models, and standards
- More than 300 participants from over 50 companies

www.opengroup.org/projects/soa
SOA WG Membership & Leadership

- Open to all Open Group Supplier and Customer Council members (Platinum members, Forum Buyout members, and Silver members)
- More than 300 participants from over 50 companies

- Forum Director
  - Dr Chris Harding, The Open Group
- Steering Committee
  - Mats Gejnevall, CapGemini, Co-Chair
  - Tony Carrato, IBM, Co-Chair
  - Chris Greenslade, CLARS, former Co-Chair
  - Jorge Diaz, IBM
- Liaison Officers
  - Ed Harrington, Model-Driven Solutions
  - Heather Kreger, IBM
Working Group Activities

Current Projects
- Ontologies for SOA
- SOA Governance
- SOA/TOGAF Practical Guide
- Service-Oriented Infrastructure
- SOA Reference Architecture
- SOA and Security
- Legacy Evolution

Completed Projects
- Definition of SOA
- SOA Case Studies
- Value That The Open Group Can Add to SOA

Other Activities
- SOA Maturity Model
- SOA Info Architecture
- SOA Japan Work Group
- SOA Source Book
The SOA Source Book

- Collection of source material for use by enterprise architects working with SOA
- Material that has been considered and in part developed by The Open Group's SOA WG
- Does not represent the final output of the work program

Working Group Activities - Overlap with OASIS and the OMG

Current Projects
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Definition of SOA

An architectural style that supports service orientation

- **Service orientation**  
  A way of thinking in terms of services and service based development and the outcomes that services bring

- **Service**  
  A logical representation of a repeatable business activity that has a specified outcome (e.g., check customer credit; provide weather data, consolidate drilling reports), is self-contained and may be composed of other Services. It is a black box to consumers of the Service

- **Architectural Style**  
  The combination of distinctive features in which Enterprise Architecture is done, or expressed

- The SOA Architectural style’s distinctive features:
  - Based on the design of the services comprising an enterprise’s (or inter-enterprise) business processes. Services mirror real-world business activity
  - Service representation utilizes business descriptions. Service representation requires providing its context (including business process, goal, rule, policy, service interface and service component) and service orchestration to implement service
  - Has unique requirements on infrastructure. Implementations are recommended to use open standards, realize interoperability and location transparency.
  - Implementations are environment specific, they are constrained or enabled by context and must be described within their context.
  - Requires strong governance of service representation and implementation
  - Requires a “Litmus Test”, which determined a “good services”
Ontologies for SOA

- **Background**
  - Need to improve understanding of SOA concepts
  - Ontologies can provide formal conceptual framework and also be basis for model-driven implementation

- **Objectives**
  - Formal OWL ontology for SOA
  - Documented so as to be generally understandable

- **Current State**
  - Complete draft of the ontology
  - “Socialized” by exposure to OMG, OASIS and W3C

- **Next Steps**
  - Complete the formal standard
  - Open Group Company Review
What Is An Ontology?

- An ontology is an expression of eternal truth
- An ontology is a political compromise on how to use a group of words
  - That is sufficiently consistent for machine processing
SOA Ontology – The Service Class

<owl:Class rdf:ID="Service">
  <rdfs:subClassOf rdf:resource="#Activity"/>
</owl:Class>

Diagram:
- Actor provides Service with multiplicity 1
- Actor consumes Service with multiplicity 1
- Service has effect on Effect with multiplicities 1 and greater than 1
- Car Wash: $5 charge
Contract
Activity

Actor performs Action
Action has component Activity
Activity is effect of Change
Change is the occurrence of Event
Event responds to Activity

performs
takes part in
has component
is effect of
is the occurrence of
responds to
The Intersecting Worlds of SOA
Concept Sources

- BPMN
- OASIS SOA RM
- IEEE 1471
- TOGAF
- IEEE 1471
- Services
- Architecture
- Design/Build
- OWL-S
- Business Activities
- Governance
- Web Services
SOA Reference Architecture

- **Background**
  - An SOA Reference Architecture will assist information technology professionals to understand and adopt SOA,
  - And can be used as an artefact in SOA development

- **Objectives**
  - One or more non-vendor-specific SOA reference architectures that are appropriate for use with TOGAF

- **Current State**
  - Base document input from IBM
  - Other input compared against base, resulting in agreed outline reference architecture

- **Next Steps**
  - Agree building blocks and complete draft
  - Review and publish
  - Identify appropriate certification programs
SOA Reference Architecture Source
Book Sections

- The Building Blocks of SOA
- A High-Level SOA Perspective
- Detailed Models for SOA Features
- Infrastructure for SOA
The Open Group SOA RA – Detailed Messaging Model

- **Consumer Program**
- **Management Program**
- **Encryption Engine**
- **Data Translator**

**Messaging Program**

- **Policy Decision Point**
- **Policy Enforcement Point**
- **Activity Monitor**
Reference Architecture Evolution

- Currently just descriptive
  - Layers
  - Architecture building blocks for each layer
  - Patterns of interaction between the building blocks and layers
- Will become prescriptive
  - Architectural Decisions
  - Realization decisions
  - Product Mapping guidance
SOA Governance

- Background
  - Governance widely recognized as crucial for SOA
- Objectives
  - Reference model and framework for SOA Governance
- Current State
  - Structure of document defined
  - > 90% of text drafted
- Next Steps
  - Progress and complete discussion of topics
  - Complete and review document
SOA Governance Aspects

A comprehensive view of SOA Governance includes:

- **People**
  - Organizational structures
  - Roles & Responsibilities

- **Processes**
  - Governing processes
  - Governed processes

- **Technology**
  - Tools
  - Infrastructure
Open Group SOA Governance Framework

SOA Governance Reference Model (SGRM)

Plan

SOA Governance Vitality Method (SGVM)

Define

Monitor

Implement

Customized and Focused SOA Governance Regimen
Processes of the Reference Model and Vitality Method

Governance Vitality
- Definition
- Planning
- Implementation
- Monitoring

Configuration

Governance Operation
- Dispensations
- Compliance
- Communication

Control

SOA Definition and Operation
- Service Lifecycle
- Service Portfolio
- Solution Lifecycle
- Solution Portfolio
The Open Group’s SOA Work

Maturity Model

SOA/TOGAF Guide

Legacy Evolution

Reference Architecture

Architect

Security

Ontology

Governance

System user

System manager

Developer

Integrator

Service provider

Service-Oriented Infrastructure

Business owner
A Vision of the Future
Software is Getting Harder

Gigabytes → Service → Iterative → Waterfall
Megabytes → Object → Iterative
Kilobytes → Procedure
Bytes → Subroutine
But Support is Improving

Architects

End users → Architects Toolkit → Models

Programmers → Software Development Environment → Software
Enterprise Development Environment

- End users
- Business Analysts
- Programmers
- Architects

Repositories

Model-Driven Engines

- BPMN
- OWL
- UDEF
- Archimate
- UML

Model

- Java
- C#

Business Processes

Software

Models
The Model-Driven Approach

Our Focus Today

ModelPro (ModelDriven.org) Open Source MDA Tools

ModelPro Provisioning Engine

SoaML Cartridge for JEE

Provisioning Profile

OMG SoaML UML Profile

Uses

Automates

Users SOA Model

Provisioning Model

UML Tool

Uses

Uses

Automated Platform Application & IDE Artifacts

Manual Platform Application Artifacts

Platform & Tools (E.G. Eclipse/Netbeans/.NET)
The SOA Module

Architects

End users → Models

Business Analysts → Business Processes

Programmers → Software

Description

Prescription
A Vision of the Future

Architects

End users → Description → Models

Business Analysts → Business Processes

Programmers → Prescription → Software

Description

Prescription
The Value of Harmonization

- A SOA Reference Architecture will help architects and developers manage the complexity of SOA.
- A standard SOA Reference Architecture will enable the development of a supporting environment.
- Without which, SOA could fail.
Conclusions

- Each organization has a unique standpoint
  - The Open Group standpoint is centered on Enterprise Architecture
- There is overlap between the work of OASIS, the OMG, and The Open Group
  - Definition, ontology, reference architecture, governance
- Increasing system complexity means that architects and developers need a shared reference and support environment
  - Which will require harmonization of SOA concepts
Standard SOA Reference Models and Architectures

The Open Group Perspective

Thank you!