Services Oriented Architecture (SOA) Integration Backbone

Brian Wolff
Sales Consultant Technology
Oracle Netherlands

Agenda
- Introduction
- Service Oriented Architecture
- Services, Integration, Connectivity
- Process Orchestration
- Demo
- Summary
Business Challenge

Isolated Assets in Diverse Technologies

- EDI
- Unix
- VANs
- RDBMS
- LANs/WAN
- Supply chain

- 60’s
- 70’s
- 80’s
- 90’s

- Mainframe
- COBOL
- ASCII
- Basic
- DEC
- HP

- Windows
- WWW
- Linux
- Java
- XML
- EAI
- CRM

Business Challenge

Monolithic Applications

- Hard to adapt to changing business requirements
- Duplication of functionality means wasted resources
- Small fixes require large investments of time and labor

Inflexible, Inefficient, Hard to Maintain
Packaged Applications, E-mail, etc.
Mainframe (Cics, IMS, IDMS, etc.)
ERP (ORCL, SAP etc.)
Home Grown, Flat file, ftp, etc.
Suppliers, Partners (B2B)
Call Center Web-Site

Reality (?)

- Consistent data view?
- Available, Scalable?
- Automated processes?
- Flexible?
- Management Information?

Approach:

Service Oriented Architecture

“S.O.A. is an architectural style whose goal is to achieve loose coupling among interacting software agents”

Source: Gartner
Service Oriented Architecture
*Integration and process Backbone*

![Diagram of Service Oriented Architecture]

Requirements for SOA

- **Orchestrate services**
  - Asynchrony, flow coord, Data transformation
  - Compensation, Version Control, Auditing

- **Expose Services, Integration**
  - Heterogeneous back ends, Silos of API’s & mechanisms
  - Heterogeneous data formats, Synchronizing data stores

- **Deploy**
  - Unpredictable loads, Assymetric performance capabilities

- **Manage & secure**
  - Access Control, Encryption, Logging, Auditing

- **Monitor**
  - Dashboard, KPI’s alerts etc.
Requirements for SOA

- Orchestrate services
  - Asynchrony, flow control, Data transformation
  - Compensation, Version Control, Auditing
- Deploy
  - Unpredictable loads
  - Assymetric performance capabilities
- Manage & secure
  - Access Control, Encryption, Logging
- Monitor
  - Dashboard, KPI’s alerts etc.

Expose Services, Integration
- Heterogeneous back ends,
- Silos of API’s & mechanisms
- Heterogeneous data formats
- Synchronizing data stores

A Service...

- Metadata
- Network Centric
- XML
  - <rate>5.6%</rate>
- Services:
  - GetCustomerInfo
  - GetReport
  - ListProducts
  - Search
  - CreditAccount
  - ProcessOrder
Introduction to Web Services

- SOA Enabler
- Components
  - Publish, Find, User Interfaces
  - Formal Service Descriptions
  - Service Interactions
  - Universal Data Format
  - Ubiquitous Communications

Web Services: An example

**SOAP Request**

```
<soap:Envelope
    xmlns:urn:xmethods-delayed-quotes="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/
    xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/
    xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <soap:Body soap:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/">
    <urn:getQuote>
      <symbol xsi:type="xs:string">ORCL</symbol>
    </urn:getQuote>
  </soap:Body>
</soap:Envelope>
```

**SOAP Response**

```
<soap:Envelope soap:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/"
    xmlns:urn:xmethods-delayed-quotes="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/
    xmlns:soapenc="http://schemas.xmlsoap.org/soap/encoding/
    xmlns:xs="http://www.w3.org/2001/XMLSchema"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <soap:Body>
    <urn:getQuoteResponse xmlns:urn="urn:xmethods-delayed-quotes">
      <Result xsi:type="xsd:float">23.79</Result>
    </urn:getQuoteResponse>
  </soap:Body>
</soap:Envelope>
```
SOA ≠ Webservices!

Oracle JDeveloper: Visually Development of Web Services
Oracle Adapters
Enterprise-strength infrastructure for connectivity to Enterprise Information Systems (EIS).

- Bi-directional connectivity
- Service Oriented Architecture (SOA)
- Open Standards Support
  - WSIF
  - WSDL
  - JCA
  - WSIL
  - SOAP
- Broad range of connectivity
- Easy-to-use Wizards
- Managed through Oracle Application Server 10g
- Seamless integration with Oracle AS products.

Oracle Integration Interconnect

- High Speed Message Throughput/Low Latency
- Minimize Coding effort for Data Integration
- Simple, Low Cost Approach for deploying integration solutions quickly

Rapidly deploy integration solutions across a heterogeneous enterprise improving the quality of information.
Multi-Transport Bus

- Portal
- .NET
- B2B

Transport

Service and Event interactions on the bus

- All services described by WSDL
- Local, In Memory
- SOAP/HTTP/Reliable SOAP
- OEMS, AQ, JMS, MQ, TIBCO

Oracle Integration B2B

An enterprise-strength infrastructure to facilitate exchange of information, electronically, between two or more enterprises

- Easy to use wizard based UI
- Comprehensive Trading Partner Management
- Extensive protocol support
- Built on a standards based scalable architecture
- An integral component of Oracle Integration
- Managed through Oracle Application Server
- Seamless integration into the E-Business Suite
Requirements for SOA

**Orchestrate services**
- Asynchrony, flow coord, Data transformation
- Compensation, Version Control, Auditing

**Deploy**
- Unpredictable loads
- Asymmetric performance capabilities

**Manage & secure**
- Access Control, Encryption, Logging
- Auditing

**Monitor**
- Dashboard, KPI’s, alerts etc.

Expose Services, Integration
- Heterogeneous back ends, Silos of API’s & mechanisms
- Heterogeneous data formats
- Synchronizing data stores

Services need orchestration

**Before:**
- Web Service1
- Web Service2
- Web Service3

**After:**
- Start
- Step 1
- Step 2
- Step 3
- End
- Web service1
- Web service2
- Web service3
Business Process Execution Language (BPEL)

- OASIS
  - Mature, de facto standard
  - 10+ yrs – roots in XLANG and WSFL
  - Wide industry adoption

- Standardized process
  - Definition and flow
  - Service execution
  - Exception management
  - Long-running transactions

Introduction to BPEL
BPEL Means Business Agility

- Frequent change
- Merger/Acquisition

Enterprise Consolidation

Oracle BPEL Process Manager

*Orchestrator AND Integrator*

- Web Service
- Java Service
- Database
- Stored Procedures
- ERP
- SAP, Oracle, etc.
- User Tasks
The Oracle BPEL Process Manager

Enterprise-strength infrastructure for designing, deploying and managing BPEL business processes.

- Comprehensive and native BPEL implementation
- Easy-to-use modeling tool
- Scalable and reliable engine
- Flexible binding framework
- Rich management and monitoring
- Support for Oracle AS, WebLogic and WebSphere
- Get up and running in less than 15 minutes!

BPEL Designer

- Native BPEL Support
- Drag-and-drop process modeler
- UDDI and WSIL service browser
- Visual XPATH editor
- Visual Assign editor
- One-click build and deploy

"Composing a business in the BPEL Designer is a relatively simple process."
- Web Services Journal
Service Adapters

KEY FEATURES
- WSIF + JCA + XML
- Rich Metadata
- Requests and Events
- Optimized Bindings
- 200+ Systems
- Fail Over Management

XSLT Mapper

KEY FEATURES
- Drag-and-drop Interface
- Built-in Library of Functions
- Support for Lists and Iterations
- Auto-mapping
- Version Resiliency
**Workflow Service**

- Routing
- Roles
- Attachments and Version Control
- Built-in Approval Patterns
- Simple Form Framework
- Email and Wireless Notification
- Built-in Worklist Application

---

**BPEL Console**

- Visual monitoring
- Auditing
- BPEL debugging
- In-flight instance administration
- Performance tuning
- Partitioning/Domains

"I found the BPEL-PM administration console easy to use, allowing me to deploy my BPEL processes, test and debug flows, collect data on transactions, and trace both completed histories and those in progress. I liked the ability to visually inspect a business flow and drill down to the underlying XML that encapsulated my transaction."

---

InfoWorld
Integration Based on Open Standards

- J2EE
  - JMS, JCA, JDBC
- W3C
  - XML, XHTML, XSLT, XPATH, XQUERY
- Web Services
  - SOAP, WSDL, UDDI, WS-* , BPEL
- Security
  - LDAP, X.509

- B2B
  - RosettaNet, UCCnet, EDI, HIPAA / HL7, ebXML

SOA ≠ BPEL!
Requirements for SOA

Orchestrate services
Asynchrony, flow coord, Data transformation
Compensation, Version Control, Auditing

Expose Services, Integration
Heterogeneous back ends, Silos of API’s & mechanisms
Heterogeneous data formats
Synchronizing data stores

Deploy
Unpredictable loads
Asymmetric performance capabilities

Manage & secure
Access Control, Encryption, Logging
Auditing

Monitor
Dashboard, KPI’s alerts etc..

Oracle ® Fusion Middleware

Development Environment
JDeveloper Application Development Framework

Information Access and Insight
Portals Wireless OCS OWB Discoverer BAM

Business Processes
BPEL Process Manager B2B Orchestration Pre-built Business Flows

Data Hubs and Integration
Enterprise Service Bus Oracle Data Hubs Adapters

SOA Run Time
J2EE Web Services Framework Event Server Rules Engine

Enterprise Grid
Oracle GRID Infrastructure

- Scalable
- Available
- Secure
- Manageable

Requirements for SOA

Orchestrate services
- Asynchrony, flow coord, Data transformation
- Compensation, Version Control, Auditing

Deploy
- Unpredictable loads
- Assymetric performance capabilities

Expose Services, Integration
- Heterogeneous back ends, Glue of API’s & mechanisms
- Heterogeneous data formats
- Synchronizing data stores

Manage & secure
- Access Control, Encryption, Logging, Auditing

Monitor
- Dashboard, KPI’s, alerts etc.
Oracle Identity Management

- Directory
- Directory Integration
- Provisioning Integration
- Delegated Administration
- Single Sign-On
- Certificate Authority
- WS Security

Manage Web Services
Oracle Web Services Management gateway

- Oracle Web Services Management Gateway
- WS-Security
- WebService management

Security
- Authorization
- Authentication
- Auditing
- Logging
- Tracing

User store (LDAP)
Oracle Database

OracleAS 10g
BEA
IBM
Tomcat/ JBoss
Microsoft
.NET
Oracle Database

Any app server or technology

Databases
BPEL Processes
Legacy Systems
Custom Apps
Packaged Apps

ORACLE
Oracle Web Services Management

Auditing, Logging, Reliability and WS-Security

Web Services Management Gateway (COREsv) Monitoring and Performance Analysis

Requirements for SOA

Orchestrate services
Asynchrony, flow coord, Data transformation
Compensation, Version Control, Auditing

Deploy
Unpredictable loads
Asymmetric performance capabilities

Expose Services, Integration
Heterogeneous back ends, Grids of APIs & mechanisms
Heterogeneous data formats
Synchronizing data stores

Manage & secure
Access Control, Encryption, Logging, Auditing

Monitor
Dashboard, KPI’s, alerts etc..
What is BAM?

- BAM is largely born-of, and is reshaping, two previously distinct technology markets:
  - Analytics and decision making of Business Intelligence market
  - Real-time and BPM linkage of Enterprise Application Integration (EAI)
- BAM focuses on what is happening, not what has, or might happen
- BAM sits in-between the historical and analytical focus of BI and the forward business planning of Corporate Performance Management

“Has happened”  “Happening”  “Could/Should Happen”

BI  BAM  BI & CPM

Service Oriented Architecture

Event Activity Monitoring

Event, Sensor
Process Orchestr.
Composite Service
Basic Service
WS, Adapter, EIB, ...
Integration
System
Heterog. Systems
IBM
Microsoft
Lotus
iPlanet
SAP

Real Time Business Monitoring
Event Drive
Enterprise Process
Business Service
Integration
BAM Active Viewer

- Real-Time KPIs
- Thin Browser GUI
- Role-Based Access
- Live Display Technology
- Portal Compatible
- Embedded Actions

BAM Active Studio

- Template-Driven Design
- User Defined Alert Rules
- Integrated analytics
- Business reporting using drill through and drill-across concepts
- Multiple displays in a report like Charts, Graphs, Lists, KPI’s, Excel
Requirements fullfilled?

Orchestrate services
Wire services into process flows, loosely coupled
BPEL, XSLT, XQuery

Deploy
Always ON, Scale on demand
Oracle Grid Infrastructure

Manage & secure
Federated Identity
WS-Policy, WS-Security
WS-Gateways (OBLIX)

Monitor
Dashboard, KPI’s alerts etc..
Oracle BAM

Expose Services, Integration
Leverage and encapsulate existing systems
Web services, Jdeveloper, Adapters, B2B framework, Interconnect

Service Oriented Architecture
Integration and process Backbone

Oracle Portal, J Developer ADF

Oracle BPEL Process Manager

Oracle J Developer ADF

Present, Appl, Interaction Multi-Channel Portal

Enterprise Process

Composite Service

Basic Service

Integration

System

Oracle WS Infrastructure
Oracle Adapter
Oracle Interconnect
Oracle B2B

Oracle BAM

Oracle Adapter

Oracle BAM

Oracle J Developer ADF