



Web Services for the Integrated Enterprise

OMG's 2nd Workshop On Web Services Modeling, Architectures, Infrastructures And Standards

February 10-13, 2003
Munich, Germany

Program

Monday, February 10, 2003

0900 - 1230 **Tutorial 1: *Implementing Model Driven Web Services Architectures using UML, XML, and WSDL***
Sridhar Iyengar, Distinguished Engineer, IBM

The software industry continues to grapple with the challenging problem of dealing with multiple industry standards and competing middleware architectures and information models/vocabularies without much regard for software architecture and design discipline. The OMG Model Driven Architecture (MDA) simplifies this problem by unifying these diverse technologies using information models/designs and mapping these models to one or more implementation technologies (middleware, databases, languages etc). MDA also raises the level of abstraction at which these applications and integration scenarios can be designed and implemented, a key requirement to manage software integration complexity. MDA defines a software architecture that complements existing middleware, modeling and tools and allows integration and interoperability to be addressed across the application life cycle and not just between individual objects or components. It exploits the strengths of Modeling, Metadata, Middleware and Mappings, the 4 M's, into a unifying framework with UML and XML taking on a foundational role. MDA allows a developer to design a model of an application or component once and automatically map these designs to several technologies. A key tenet of MDA includes reverse engineering that allows developers not familiar with modeling to incrementally gain the benefits of modeling and software architecture.

0900 – 1230 **Tutorial 2: *Web Services and Service Oriented Architectures***
Peter M. Herzum, CTO, Herzum Software

This fast-paced tutorial provides the state of the art and a comprehensive overview of concepts, new standards and technologies and lessons learned from their usage, platforms, architectures, methodologies for Web Services and Service Oriented Architectures.

The tutorial then presents other architectural challenges of web services, such as architectures for service registries and their influence on performance, scalability, security, and deployment models; technical and business negotiation and how Service Oriented Architectures can best take advantage of these aspects (today and in the foreseeable future); ontologies and semantic standards required to support federations of business systems collaborating together; the switch from interface definition to contract definition; security aspects in Service Oriented Architectures, and more. The tutorial also discusses current adoption in the industry, provides an example of adoption for system integration and an example for multi-enterprise collaboration.

1030 – 1045 Morning Refreshments

1230 – 1330 Lunch

1330 – 1530 ***Session 1: Implementing Web Services Platforms:
The Rubber Meets the Road***

Chair: Sridhar Iyengar, Distinguished Engineer, IBM

A Web Services platform incorporates many resources - registry services, directory services, bridges and even elements from CORBA, J2EE and other platforms. The speakers will discuss classical engineering problems which must be addressed in implementing such resources and review the lessons learned:

* Sean Baker advances the case for integrating differing middleware platforms to provide a multi-level Service Oriented Architecture

* William Cox discusses resource implementation in J2EE

* Adrian Trenaman discusses resource intercommunication through the use of an IIOP-SOAP bridge from CORBA

Web Services, CORBA and Other Middleware

Sean Baker, Chief Corporate Scientist, IONA

Web Services complements other middleware in a number of ways. For example, CORBA offers Web Services a mature platform to implement services; Web Services offer a straightforward path to web enabling CORBA applications. In addition, Web Services, CORBA, and other middleware platforms can participate in a multi-level Service Oriented Architecture, with Web Services contributing to the middleware-to-middleware integration. This paper describes the relationship between Web Services, CORBA and other middleware. It argues that different forms of middleware should be used together so that developers and integrators can choose from a well-integrated toolkit of different technologies.

J2EE and Enterprise Web Services

William Cox, Technical Director, Architecture & Standards, BEA Systems

This presentation will focus on the current state of the art in defining Enterprise Web Services and the implementation in the J2EE environment. It will include discussion of JAX-RPC, JSR109/Enterprise Web Services, Java Messaging System extensions for XML and Web Services, directories and registries (JAX-R, UDDI, ebXML RegRep), and interoperability.

Exposing Web Services to CORBA Clients

Adrian Trenaman, Senior Consultant, IONA

This presentation will describe the design and implementation of an IIOP-SOAP bridge that enables CORBA clients to invoke on web services using IIOP. While it is common to find Web Service toolkits that expose CORBA servers as web services, there is a lack of tools for exposing web services to CORBA clients. Using this IIOP-SOAP bridge, a systems integrator could expose a non-CORBA service using WSDL, which could then be exposed to CORBA clients using IDL. Issues such as security, asynchronous invocation, protocol mapping and object publication will be discussed.

1530 – 1545 Afternoon Refreshments

1545 – 1745 ***Session 2: Web Services Security:
Where the Hard Questions are Asked***
Chair: Fred Waskiewicz, Director of Standards, OMG

Authentication, authorization and confidentiality are inherently difficult problems and the trust technologies that attempt to solve them are complex. The Web Services security standards do not, for the most part, invent new techniques. Rather, they address how to apply known techniques in the loosely coupled world of the web. The presentations review these emerging standards and discuss lessons learned in their usage.

Web Services Security with SOAP Security Proxies

Gerald Brose, Security Architect, Xtradyne Technologies

With Web Services relying on SOAP over HTTP, typical perimeter security mechanisms are no longer effective. This presentation outlines the major security challenges in Web Services environments and summarizes the emerging standards by the W3C and OASIS that address these problems (SAML, XACML, WS-Security). We present SOAP security proxies as a flexible approach to leverage the concepts put forward in these standards. SOAP security proxies are application-level security appliances that can be easily integrated into existing Web Services infrastructures and do not require changing existing applications.

Identity, Security, and XML Web Services

Jørgen Thelin, Chief Scientist, Cape Clear Software Inc.

The use of security credentials and concepts of single-sign-on and “identity” play a big part in Web Services as developers start writing enterprise-grade line-of-business applications. An overview is provided of the emerging XML security credential standards such as SAML, along with various “identity” standards such as Passport and Liberty. We examine how “identity aware” Web Service implementations need to be, and the value a Web Services platform can add in reducing complexity in this area, with lessons drawn from experiences using J2EE technology for real-world security scenarios.

Securing Web Services Using Microsoft WSDK

Petr Palas, Software Architect, Moravia IT

Web Services security has been an important issue since the very beginning. It’s one of the main factors that slow down the deployment of Web Services in real-world applications. Microsoft, IBM and other leading companies address these issues with the WS-Security standard. The presentation shows you how Microsoft Web Services Development Kit can help you secure your Web Services built on the .NET platform. It also mentions other upcoming standards related to the Web Services security.

Tuesday, February 11, 2003

0900 – 0915 ***Workshop Welcome and Opening Remarks***

Program Committee Co-Chairs:

Fred Waskiewicz, Director of Standards, Object Management Group

Peter Herzum, CTO, Herzum Software

0915 – 1200 ***Session 3: Service Oriented Architectures***

Chair: Peter Herzum, CTO, Herzum Software

In the last two years, many companies have adopted Service Oriented Architectures for both new development and integration with legacy systems. Based on real-world experiences, this session presents patterns, architectures, architectural concepts, and specific uses of technologies that have proven to work. This session starts with a comparison of architectural styles. Service Oriented Architectures are then analyzed within the context of integrating mainframe systems using various technologies. The same problem is then discussed from a MDA perspective. Finally, a reference architecture with patterns and solution strategies for CORBA-based Service Oriented Architectures is discussed

A Comparison of Service-oriented, Resource-oriented, and Object-oriented Architecture Styles

Jørgen Thelin, Chief Scientist, Cape Clear Software Inc.

The three common software architecture styles frequently used in distributed systems and XML Web Services are compared and contrasted. In particular, the key differences between traditional SOAP and REST styles are explored. Guidelines are presented on which style is most applicable for certain application scenarios, and when a combination of styles is necessary.

Service Oriented Mainframe Integration with CORBA, J2EE and Web Services

Arne Koschel, Technical Product Manager, IONA

New large scale distributed enterprise applications will demand "peer to peer" secure interoperability amongst J2EE Application Servers and backend systems, especially existing mainframe systems with their huge IMS/CICS-based COBOL/PL-I applications. Such systems are may integrated by means of CORBA, JCA, JMS etc. This talk will present how all these technical elements can interoperate in an open standard based environment. It will cover: service oriented mainframe integration by means of CORBA, J2EE, Web Services; Web Services to CORBA and EJB interoperability; security interoperability scenarios; 2-PC transactions across EJB, CORBA and mainframe CICS/IMS transactions; and example architectures and scenarios from real-world large scale customer applications.

1015 – 1030 Morning Refreshments

Model Driven Legacy Integration using MDA and EDOC

Rüdiger Schilling, CTO, Delta Software Technology

This session shows how legacy applications and data stores are easily transformed into "adaptive services" using a service-oriented integration architecture based on OMG's Model Driven Architecture (MDA) and the Enterprise Distributed Computing (EDOC) standard. Legacy interfaces are captured into Platform Independent Models (PIMs), augmented with the service component interfaces to be targeted. Mappings from service component interfaces to legacy application functions are "composed" at the PIM level. MDA generators transform PIMs to Platform Specific Models (PSMs) from which the full program source code is then generated.

Strategies for Use of Web Services and Reuse of CORBA Business Applications

Dave Knox, Senior Architect, IONA

This presentation details patterns that can be used to analyze complexity, design, plan, and implement web services as access points and focuses on exposing existing CORBA investments without compromise. The presentation begins with the business and economic issues that compel reuse and are constantly confronted by IT organizations. It proceeds to explain the hierarchy of patterns, and then details four Integration Patterns. The presentation concludes by leveraging the Patterns and a reference architecture to illustrate example solutions in the Finance and Telecommunications verticals.

1200 – 1800 ***Demonstration Area Open***

1200 – 1300 Lunch

1300 – 1400 ***Sponsor Presentation - Service Oriented Architectures***
Michael Platt, Solutions Architect, Microsoft Corporation.

1400 – 1530 ***Session 4: Web Services Standards***
Chair: Fred Waskiewicz, Director of Standards, OMG

Standards are key to solving technical problems like interoperability, transactional support, deploying, discovery and linking mechanisms among federated Web Services and their clients. This session provides insight into these and other issues facing industry and how organizations like WS-I and OASIS are addressing them.

Interoperability and Web Services

Christopher Ferris, Architect, IBM

In this presentation we will discuss the interoperability issues facing users, vendors and implementers of both new and established Web Services technologies. We will discuss the Web Services Interoperability Organization, outlining the approach that its members are actively pursuing to address the interoperability issues they face. We will review the WS-I Basic Profile 1.0 deliverables, putting them into perspective for the IT executive, Web Services developer, and technology vendor. Finally, we will consider the forecasted next steps for the WS-I organization including potential candidates for future profiles and its approach to addressing the issue of profile composition and versioning.

Web Services and Transactions

William Cox, Technical Director, Architecture & Standards and Sanjay Dalal, BEA Systems

Business Transaction Processing (BTP), an XML-based distributed transaction protocol for "distributed" business transactions, is an OASIS Committee Specification (today). The combination of WS-Transaction and WS-Coordination efforts cover some of the same space and are expected to be submitted to a standards organization in 2003. This presentation discusses the evolution from tightly-coupled to loosely-coupled services in distributed enterprise systems. In the same context, the two approaches are compared and contrasted using these two transaction protocols from an architectural perspective. It will be shown how these approaches affect application requirements, and how they can satisfy real world needs will be analyzed.

Portals, Portlets and Web Services for Remote Portlets

Carsten Leue, Chief Programmer-WebSphere Portal Server & Thomas Schaeck, Architect, IBM

This presentation gives a brief introduction to portal architecture and explains the notion of pluggable portal components - portlets – and motivates the need to enable simple integration of remote portlets provided by content providers, application providers or other portals in portals. It gives an overview of the WSRP standard and explains how it satisfies this need, allowing portlets to be published as WSRP services and WSRP services to be integrated as portlets.

1530 – 1600 Afternoon Refreshments

1600 – 1730 ***Panel: Web Services Standards***

Moderator: Fred Waskiewicz, Director of Standards, OMG

Software standards will play a key role in defining architectures that will drive the design of federated systems capable of collaboration necessary to solve business problems at the enterprise level. Standards will also ensure interoperability between Web Services and among the tools that develop and implement these services. This panel of standards organization representatives and Web Services implementors and users will assess the state-of-the-art of Web Services standards in meeting these goals.

Panelists: Christopher Ferris, Architect, IBM
William Cox, Tech. Director, Architecture & Standards, BEA Systems
Carsten Leue, Chief Programmer-WebSphere Portal Server, IBM

Wednesday, February 12, 2003

0830 – 1030 ***Session 5: Enterprise Collaboration and Business Processes using Web Services***

Chair: Peter Herzum, CTO, Herzum Software

Web Services are rapidly enabling new ways to support enterprise collaboration and business processes, and this is becoming an important field of application for Web Services and Service Oriented Architectures. This session discusses BPEL4WS, the most promising new standard in this space. It then discusses the subject from the point of view of large Web Services projects, and the mapping of IT Strategy into IT architecture to support business process. It finally discusses a concrete and critical enterprise collaboration issue: the building of trust among participants, and concrete support to this issue through technology and architecture.

Composing Web Services Using BPEL4WS

Francisco Curbera, Manager-CSG & Rania Khalaf, Software Engineer, IBM T.J. Watson Research Center, Frank Leymann, Distinguished Engineer, IBM Software Group

Composition is a key aspect of service-oriented computing, enabling the modeling of interactions between services and the subsequent reuse of these models. In this work, we present the Business Process Execution Language for Web Services (BPEL4WS) and show how it can be used to compose Web Services. We stress the highlights of the standard, which include structured activities, correlation, compensation, and fault handling.

Web Services – A Consultant’s View: From IT Strategy to IT Architecture

Hans-Peter Hoidn, Timothy Jones, Jürg Baumann & Oliver Vogel, Principal Consultants, IBM BCS

The purpose of IT solutions – including Web Services - is to support the business that may be defined by business models and described by business processes. The talk emphasizes the need to take a complete holistic view of business processes and demonstrates the need to map this to an architectural view covering different technologies but addressing business processes in their entirety

Building Trust to Stimulate Web Services Commerce

Ana Belén García Díez, Information and Communication Technologies, European Software Institute (ESI)

ESI has performed, jointly with some industrial partners, research on how to build trust among potential Web Services consumers. Our presentation shows the results of this research and some approaches to increase confidence. Main results to be presented are: criteria that impact on consumers’ confidence on using Web Services; additional information to be provided with a Web Service to build trust; and dynamic composition as an architectural solution to include redundancy and protect from Web Service failure.

1000 – 2000 ***Demonstration Area Open***

1030 – 1100 Morning Refreshments

1100 – 1230 ***Panel: Building a Business Plan around Web Services***

Moderator: Fred Waskiewicz, Director of Standards, OMG

Now that the initial excitement has subsided, product plans are in place, and development is under way, what can the user community - those trying to form their own business plans incorporating Web Services and federated architectures - reasonably expect? And when? This panel of Web Services vendors will help answer these crucial business questions.

Panelists: Gregg Bjork, Systinet
Sean Baker, IONA
Sridhar Iyengar, IBM

1230 – 1330 Lunch

1330 – 1530 ***Session 6: Tool Support for Web Services Development***

Chair: William Cox, Technical Director, Architecture & Standards, BEA Systems

This session explores the requirements for and usage of commercially available tools to develop, deploy and use scaleable Web Service applications at the enterprise level.

Orchestrating Web Services from a UML Development Platform

Michel Brassard, Founder and CTO, Codagen Technologies Corporation

Web Services enable a code reuse pattern that makes them available to applications without requiring physical co-location. This session will focus on how UML can be applied to the development environment to solve common challenges, including: reusing business scenarios and Web Services across multiple business processes; enforcing a business process over a loosely coupled implementation; enabling business analysts to work collectively when modeling business processes; and implementing business processes that satisfy contracts between trading partners. Upon completion, attendees will learn, through real-world examples, how to maximize their UML investments without a working knowledge of the standard.

Universal Web Services for Providing Enterprise Data

Petr Palas, Software Architect, Moravia IT

As soon as Web Services become a common channel for enterprise data exchange, companies will challenge new issues. How can we secure our data and control the access? How should we describe our data structures so that our partners know where to find and how to consume information from our systems? The presentation focuses on these questions and explains how you can benefit from a universal Web Services tier in comparison with an ad hoc Web Services.

Tool Support for Developing Scalable J2EE Web Service Architectures

Guus Ramackers, Product Manager UML and Web Services, Oracle

Developing scalable Web Service applications for the J2EE requires a careful approach to defining the right interfaces, as well as the right implementation behind those Web Service interfaces. Application frameworks provide an architectural basis and effective starting point for doing so, enabling both short running and long running transactions across inter-organizational boundaries. To make the development of Web Service applications productive, however, tool support must enable the developer to rapidly model Web Service requirements, apply implementation frameworks, and to generate and manage the resulting artifacts in a coherent manner. This presentation explores the requirements for tool support for Web Service applications, using Oracle JDeveloper 9.0.3 as an example of a highly integrated tool that supports incremental development of Web Service applications.

1530 – 1600 Afternoon Refreshments

1600 – 1730 ***Session 7: Semantic Interoperability of Web Services***

Chair: Arne Berre, Chief Scientist, SINTEF Telecom and Informatics

The Integrated Enterprise cannot be realized without support for semantic interoperability of the supporting services. This requires mechanisms beyond simple signature definitions in WSDL or similar. This session presents approaches to and experiences from meeting the need for semantic interoperability of services, and will discuss required further work in this area.

The Web Services Scandal: The Overlooked Issue of Data Semantics

Jeffrey Pollock, CTO, Modulant

The scandal about Web Services is the assumption that either every system using them will be speaking the exact same language and dialect, or a translation service will have to be coded to enable systems to communicate well. Web Services technology, despite its potential benefits, is limited in its ability to work with randomly formatted, non-standard data or data not based on XML. It's not yet a ubiquitous solution. This presentation will examine the nature of the data semantics problem and present practical solutions that IT managers may implement to solve this problem within the Web Services framework.

Semantic Network Services

Thomas Bandholtz, Manager-CM/KM, SchlumbergerSema

Use case report on a R&D project implementing a Topic Map as a Web Service (Research project UFOPLAN-Ref. No. 20111612, promoted by BMU/UBA, Germany). The primary use is in a public portal of the Federal Agency of Environmental Protection in Germany (GEIN - German Environmental Information Network), but the service is provided for general usage in the scope of environmental information in the "Semantic Web". The system delivers multilingual taxonomy services, including auto-classification features, based on a Topic Map (ISO 13250). The Topic Map contains and integrates a thesaurus, a gazetteer, and a chronology (approx. 100.000 terms).

1800 – 2000 ***WORKSHOP RECEPTION hosted by Sponsor***

Thursday, February 13, 2003

0900 – 1115 *Session 8: Case Studies*

Chair: Hans-Peter Hoidn, Principal Consultant, IBM BCS

This session will present four case studies focusing not on infrastructure, but rather on application-specific domain solutions. Speakers will discuss the detailed problems in their application domains, how they solved those problems and explain the drivers for their solutions.

Composable GIS AND E-Commerce Services in Crisis Management Systems - Using The Combine MDA Approach

Arne J. Berre, Chief Scientist, SINTEF Telecom and Informatics

The European project ACE-GIS (Adaptable and Composable GIS and E-Commerce services) addresses a Model Driven Architecture approach to the specification and development of semantic interoperable services for Crisis Management and Environmental planning systems. The methodology and tool-support for service-oriented architecture specification is provided by the COMBINE project (Component-Based Interoperable Enterprise system development), with enhancement for model-based composition, using UML activity diagrams and mappings to BPEL4WS/BPML. The underlying standard services are based on the OGC Open Web Services for GIS components, and on a Web Service infrastructure extended with ebXML Registry/Repository support.

Web Services - A Seamless Continuation of Other Technologies

Martin Senger, European Bioinformatics Institute

The use cases presented show the symbiosis between an existing CORBA implementation and a new Web Services layer (project "Soaplab" defining Web Services for a programmatic access to the remote applications), and between an adopted CORBA specification and Web Services (project "Bibliographic Query Service" illustrating how an adopted OMG specification, originally designed only for CORBA, can be easily converted and used by the Web Service technology). Both use cases have been developed in the EMBL-EBI (European Bioinformatics Institute).

1000 – 1015 Morning Refreshments

New e-Business Opportunities and Models Based on Web Services

Ana Belén García Díez, Information and Communication Technologies, European Software Institute (ESI)

The distributed and collaborative nature of Web Services require new business models. ESI has carried out a case study of converting a traditional software system (package) into a service offered through the web that customers can integrate in their own application. Based on this case study, the following is presented: an approach to "think on services" and move from traditional business models to Web Services-based business models; and a practical example of the implementation of this approach.

1115 – 1200 Additional Presentation – Microsoft / Unisys

1200 – 1300 Lunch

1300 – 1500 ***Panel: Enterprise Web Services--Where Are We Going?***

Chair: William Cox, Technical Director-Architecture & Standards,
BEA Systems

The first generation of Web Services specifications are coming into broader use; the second generation (e.g. SOAP 1.2, WSDL 1.2, Web Services Security, UDDI 3+) are nearing completion though not yet deployment. A group of Web Services specifications such as Web Services for Remote Portals/Portlets, WS-Reliability, SOAP-Conversations, BPEL4WS and WS-Transaction/WS-Coordination are being proposed through standardization processes. These all address issues common to business/government enterprises. Where is the Web Services community headed? And what should we focus on in the near future? This panel will address the future directions of Web Services and related specifications and implementations.

Panelists: TBA

1500 – 1515 ***Closing Remarks***

Program Committee Co-Chairs:

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Members: Rebecca Bergersen, *IONA Technologies*
Cory Casanave, *Data Access Technologies*
Bill Cox, *BEA Systems*
Hans-Peter Hoidn, *IBM*
Sridhar Iyengar, *IBM*
Sumeet Malhotra, *Unisys*
Bob Marcus, *Emerging Technology Strategies*
Kevin Loughry, *Object Management Group*
Jishnu Mukerji, *Hewlett-Packard*
Jon Siegel, *Object Management Group*
Richard Mark Soley, *Object Management Group*
Akira Tanaka, *Hitachi*