MDA®, SOA and Web Services Workshop:
Delivering the Integrated Enterprise - Practice, not Promise

Orlando, FL USA   -   March 21-24, 2005

Workshop Program

MONDAY – March 21, 2005

MORNING/EARLY AFTERNOON TUTORIAL

0900 - 1430   ***Introduction to Web Services and Service-Oriented Architecture***
Eric Newcomer, CTO and Sean Baker, Chief Corporate Scientist, IONA Technologies

This ¾ day tutorial starts with the basics of Service Oriented Architecture and their role in distributed enterprise computing, and then introduces Web Services, starting with XML basics, WSDL (Web Services Definition Language), and SOAP (Simple Object Access Protocol). A segment on the "big picture" suggests the types of applications that Web Services implement well, and how they fit into a representative enterprise architecture.

1030 - 1045   Morning Refreshments

1200 - 1245   Lunch

AFTERNOON TUTORIALS: TRACK A

1300 - 1430   ***Introduction to Web Services and Service-Oriented Architecture***
Eric Newcomer, CTO and Sean Baker, Chief Corporate Scientist, IONA Technologies

1500 - 1700   ***Web Services and SOA in the Enterprise***
Cory Casanave, President, Data Access Technologies.

This tutorial examines WS and SOA applications in the context of the overall enterprise – where they give the most benefit; how they integrate with legacy applications; and even a look at where other types of architecture might work out better. Enterprise modeling techniques and patterns build a foundation for evaluation of benefits versus costs.

AFTERNOON TUTORIALS: TRACK B

1300 - 1700   ***Introduction to Eclipse Modeling Framework***
Elena Litani, Software Developer and Marcelo Paternostro, Software Engineer, IBM

This tutorial will provide an in-depth look at model-based development and data integration with Eclipse Modeling Framework (EMF). We will start by highlighting the highest value features of the framework, which every EMF developer should know about, and then delving into the darker corners to expose some of its lesser known capabilities. We will also describe motivations for Service Data Objects (SDO) specification; discuss SDO programming model and the relation between EMF and SDO.

1500 - 1515   Afternoon Refreshments

TUESDAY – March 22, 2005

MORNING TUTORIAL: TRACK A

0900 - 1200   *Introduction to OMG's Unified Modeling Language (UML) and Model Driven Architecture (MDA)*
Sky Matthews, IBM Rational

This half-day tutorial starts with an introduction to OMG's UML and the foundation modeling specifications that support it, enabling the transformations that form the MDA. The second half of the session covers the MDA – what it is, how it works, and the benefits to both the business and technical aspects of application development and integration.

MORNING TUTORIAL: TRACK B

0900 -1200   *Advanced Enterprise and Federation Application Integration with MDA, SOA and WS*
Matthew Hettinger, President and Chief Architect, Mathet Consulting

This tutorial is an advanced architecture and engineering presentation of enterprise and federation application systems integration, interoperability and collaboration based on MDA, SOA and WS. It will cover, in part: Voice and data systems integration; IT management and business application systems integration; Security and Privacy systems integration; LOB application creation and integration; Build environment systems integration. A major theme that will run throughout the tutorial is a holistic systems approach to architecture and engineering and how MDA, SOA, and WS working together support this approach.

1030 - 1045   Morning Refreshments

1200 - 1245   Lunch

WORKSHOP SESSIONS

TRACK A: MDA, SOA and Web Services

1255 – 1300   *Opening Remarks –* **Workshop Co-Chair**
Jon Siegel, Vice President-Technology Transfer, Object Management Group

1300 – 1500   **Session 1A:** *Established and Emerging WS and SOA Applications and Integration Techniques*

This session starts the workshop off with descriptions of established and new uses and integration techniques in SOAs and WS-based applications. In this session, the focus is on the architecture and functionality of the application, and not on how it was modeled.

SOA Based Integration Techniques and Architecture
Mike Rosen, CTO, Wilton Consulting

Using SOA to implement enterprise and application integration requires more than just a Web service based infrastructure. The key challenge is first to create an enterprise model that decomposes business processes into

services, and then to map those services to existing applications using Web services. This session will discuss an SOI (Service Oriented Integration) reference architecture and how it helps with the challenges of defining and mapping services.

Managing Web Services and SOA for Reuse
Charles Stack, CEO, Flashline, Inc.

Service-oriented architecture and web services significantly improve organizational operating efficiency and business agility. Once services are created, they must be communicated throughout an enterprise for use and reuse among development teams. This session will cover best practices for managing services for maximum return. Documentation, metadata, SOA governance, quality of service, and managing services alongside other assets of the IT supply chain will be explored.

TRACK B: Modeling and IDEs

1255 – 1300 *Opening Remarks* – Workshop Co-Chair
Fred Waskiewicz, Director of Standards, Object Management Group

1300 – 1500 Session 1B: *Modeling Methods and Techniques*

This session offers guidance in practices and techniques employed when tasked with the complexity of systems and application development and integration at the enterprise level. Offered will be an introduction to the notion of "object class group" - a group of object classes and their associations; an introduction to the 2+9+1 modeling framework which provides an implementation framework for MDA and guidance in using UML to capture various viewpoints; and a discussion on how an existing database can be reverse-engineered to build a database diagram from which a specific language-independent SQL target can be generated.

The 2+9+1 Modeling Framework
Chris Armstrong and Bobbi Underbakke, Adaptive Team Collaboration, Inc.

The 2+9+1 Modeling Framework provides a robust foundation for addressing the varied needs of different groups of stakeholders. Architecture is not solely a concern of "traditional" software architects and needs to be extended to include the business, user interaction, data, test, and security arenas. The 2+9+1 view is an evolution of the original 4+1 view conceived by Philippe Kruchten. The 2+9+1 view is the foundation of the Adaptive Team Collaboration Process (ATCP) modeling approach. In this presentation, you will be introduced to the 2+9+1 view, how it provides an implementation framework for Model-Driven Architecture, and guidance on applying the Unified Modeling Language for capturing the various viewpoints in an integrated model.

An Introduction to Object Class Groups
Peter Chang, Associate Professor, Lawrence Technical University

We present the concept of object class groups that was originated from George Polya's famous classic book "How to Solve It." An object class group consists of object classes and their associations. All attributes of an object class are considered as parts of an object group that this class belongs. Object class groups agree with each other in some respect. Analogous object class groups *agree in certain relations* of their perspective parts. In this case, solving problems in one group may help solve problems in another group. A comparison of this concept with other concepts in the object-oriented fields will also be presented.

The EclipseUML Database POJO Cycle
Xavier Maysonnave, VP Consulting, Omondo

EclipseDatabase is a plug-in that is bundled with EclipseUML Studio Edition. EclipseDatabase is built on top of Eclipse and provides tools and UML diagrams to manage both business logic and database design needs. Based on open source and standard technologies, database architects can design their database structure. Forward, Reverse Engineering and Visual Diagramming provide facilities to speed up their productivity. Application developers can focus on their business needs using UML class diagrams. The Hibernate UML2 Profile implements an Object / Mapping Relational (ORM) solution. Apache Torque and Apache OJB's ORMs are also available. Technologies such as templates tools (Velocity), standards (UML2, XML), and open source layers (Eclipse, GEF, EMF, EclipseUML2, ...) help teams to solve the so-called object / relational paradigm mismatch.

1430 – 1800   *Demonstration Area Open*

1500 – 1530   Afternoon Refreshments

TRACKS A & B

1530 – 1800   **Session 2:** *SOA and Web Services Application Design and Integration Using UML and MDA*

Now that we've seen what SOA and WS applications can do, we'll take a look at how modeling with UML and implementation using MDA can help design, build, extend, and maintain WS and SOA applications.

Applying Model Driven Architecture to Services Oriented Architectures Using Web Services
Cory Casanave, President, Data Access Technologies.

Service Oriented Architectures (SOA) and Web Services provide the technical basis for messaging, but are only part of the solution. Making a SOA solution for integration, collaboration and supply chain automation requires that multiple technologies be used and integrated. It requires new and legacy applications to be integrated into a seamless, maintainable and robust solution. The Model Driven Architecture provides the basis for a high-level and full life-cycle approach to web services. By combining Web Services and MDA we are able to drive our SOA solution from high-level business semantics, making sure our solution meets requirements and also making it easier to develop and maintain. We are also able to integrate web service and other technologies, providing a more cohesive environment. The presentation will show how to apply MDA to SOA and Web Services to achieve business goals. The result of applying these techniques can result in the enterprise being more agile, more efficient and better able to collaborate inside and outside the corporate boundary.

Development Project Risk Mitigation Using MDA
Chris Lema, Vice President-Technology, SOSY Inc.

How do you know that the web services requested are exposing the right business logic? How can you validate stakeholder requirements in a matter of days instead of weeks? MDA helps you mitigate development risks by focusing more on the exposed logic and less on the protocol standards. This talk will walk you through an analysis and development approach, using MDA, that highlights how web services and business logic can be automatically generated for enterprise applications, reducing project risks quickly.

The Model Driven, Service Oriented Enterprise
Fred Cummins, EDS Fellow, EDS

This talk will describe the use of models to transform an enterprise to an event-driven, service oriented architecture with business process management, business rules and architecture driven modernization. This will include discussion of OMG standards work on Business Semantics of Business Rules, Business Process Definition Metamodel, Organization Structure Metamodel, and Knowledge Discovery Metamodel.

Using MDA to Integrate Corporate Data into an SOA
Randall Hauch, VP Development & Chief Architect for Metadata Management, MetaMatrix.

One challenge of implementing a Service Oriented Architecture (SOA) is to have services that provide unified, integrated and real-time access to an enterprise's existing corporate data, even when the data are stored in many legacy, relational and other data sources. Model-driven Enterprise Information Integration (EII) technologies make it possible to provide such services by modeling the available information, the desired information, and the relationships between them. Thus, model-driven EII is a critical part of any SOA where the goals are decoupling (or loose coupling), abstraction, integration, flexibility, speed and agility.

1800 – 1900   *Demonstration Area Reception*

hosted by   **Mathet Consulting**   SOSY   om**o**ndo THE LIVE UML COMPANY   SPAR⬛ SYSTEMS

WEDNESDAY, March 23, 2005

<u>**TRACKS A & B**</u>

0900 - 1115   **Session 3:** *Tool Chains for Design and Implementation of WS and SOA Applications*

Whether constructed using MDA or by hand coding, WS and SOA applications will be built with the aid of development tools. Talks in this session will describe either an individual tool that fits into a chain, or the way a number of tools work in sequence to cover the development process.

Service-Oriented Modeling and Architecture (SOMA) Method: from Business Intent to IT Realization
Luba Cherbakov, IBM Distinguished Engineer, IBM Global Services

The Service-Oriented Modeling and Architecture (SOMA) method provides in-depth guidance on how to move from the business models created through the IBM Component Business Model™ method or similar business analysis techniques, to the models required by a SOA solution design. SOMA aims at enabling target business processes through the identification, specification and realization of business-aligned services. SOMA creates continuity between the business intent and IT implementation by extending business characteristics (e.g. business goals and key performance indicators) into the architectural decisions. The analysis and modeling performed during SOMA is technology and product agnostic, but establishes a context for making technology- and product-specific decisions in later phases of the lifecycle.

Tooling for the MDA/SOA Software Lifecycle
Karl Frank, Principal Architect, Product Strategy and Architecture, Borland Software

The goals of building the right software, building it timely and building it rightly, are familiar challenges for us all. MDA and Web Services do not change this: An SOA that will give business value requires more than one skill set, a staff of more than one, using more than one tool, to define, design, and deploy. It is gratifying to see then that the topic of Tool Chains is on our agenda. Our topic: What is the MDA/SOA lifecycle, and should it be provisioned? How much do MDA and SOA change matters?

MDA Tool Support for SOA and Integration
Mike Rosen, CTO, Wilton Consulting

MDA can be used to create, enforce and automate custom architectures and applications. This sessions describes an integrated set of tools that support the full lifecycle of MDA development for SOA, including the reference architectures, ESB based platform model, CIM to PIM, and PIM to PSM transformations, and a supporting development process.

1000 - 1600   *Demonstration Area Open*

1000 - 1030   Morning Refreshments

1120 – 1140   *Sponsor Presentation* – **Mathet Consulting, Inc.**
Matthew Hettinger, President and Chief Architect, Mathet Consulting

1140 – 1200   *Sponsor Presentation* – **Sosy, Inc.**
Chris Lema, Vice President-Technology, SOSY Inc.

1200 - 1245   Lunch

1300 – 1320   *Sponsor Presentation* - **The New Omondo Software Business Model**
Vladimir Varnica, Founder & VP Sales, Omondo

Using EclipseUML Studio Edition will allow your company to win in today's highly competitive marketplace, build software fast and efficiently - while minimizing risk, reducing complexity and optimizing resources. Giving Partners, Project Managers, Lead Technologists, Architects, Practitioners access to the same tool for the entire project life cycle and having a tight integration of Eclipse and EclipseUML tools, allows you to rapidly and efficiently create, deploy and maintain higher quality applications at a lower cost.. Our aim is to provide a comprehensive set of tools that allows all members of your organization, both technical and non-technical, to be able to communicate and collaborate effectively to create the systems the business demands.

1320 – 1340   *Sponsor Presentation* – **Sparx Systems Enterprise Architect: Existing and Future Support of Model Driven Architecture**
Bob Roth, U. S. Business Development Manager, Sparx Systems

Sparx Systems is a long standing supporter of modeling standards developed by the OMG and other bodies. The CASE modeling tool Enterprise Architect has been developed to support many aspects of MDA. This presentation aims to introduce Sparx Systems and Enterprise Architect with a focus on current and future developments regarding MDA.

TRACK A: MDA, SOA and Web Services

1400 – 1700   **Session 4A:** *Middleware in SOA and WS Applications*

SOA and WS applications typically communicate using XML, WSDL, and SOAP, but most enterprise uses will require integration with legacy applications running on other middleware and some SOA implementations will benefit from another protocol. This session examines the role of a range of middleware and network protocols such as CORBA in SOAs and WS applications.

Middleware Interoperability in SOA Applications
J. Alan Brown, Senior Systems Engineer, IONA Technologies

Middleware applications typically communicate using a single standard or proprietary technology such as CORBA, MQ, Tuxedo, Tibco, etc. SOA and Web Services applications normally use SOAP/XML and HTTP. How do you move legacy applications and standard and proprietary middleware technologies seamlessly into a modern Services Oriented Architecture? This presentation focuses on the options available for building a SOA while integrating legacy applications and middleware technologies (including with each other) and discusses a best practices approach to implementing this architecture.

Agent-based Process Management for SOA and WS Applications
Jim Odell, Director, Methodology & Modeling, Agentis

With an agent-based application architecture, business process management (BPM) can become more adaptive and robust than with conventional RPC-based, object-oriented or messaging middleware. Using this approach also

enables SOA and WS applications to be created using an MDA approach based on activity diagrams. This presentation describes the agent-based architecture and discusses how agents can be and are currently designed, built, and used in this way.

Architectural Reference Models in Middleware Solutions
Bill Nadal, CTO, Herzum Software LLC

With the temporal focus on the service protocol du jour, keeping your architectural perspective in world of SOA, Web Services and Molecular Messengers is a never ending challenge. This talk will cover the dimensions of an "interoperability reference model" and discuss how it facilitates the selection of the appropriate SOA middleware solution when done with a clear understanding of the appropriate information exchange models.

Event-Driven Architecture Augmenting Service-Oriented Architectures
Badri Sriraman, Lead IT Architect, Unisys, and Rakesh Radhakrishnan, Enterprise IT Architect, Sun Microsystems

MDA (Model Driven Architecture), SOA (Service Oriented Architecture) and EDA (Event Driven Architecture) form an axis of Architecture Strategies that make up the evolution of any software architecture in the architectural solution space. This belief stems from the fact that three fundamental orthogonal elements of any software are structure, function and data. Authors believe MDA, SOA and EDA are orthogonal concepts that are evolved forms of these fundamental three. MDA addresses structuring through abstractions; while SOA defines functions in chunks and EDA describes the data in context. Along these lines the authors discuss 5 major value propositions of EDA for SOA, namely:

- User Affinity in Service Delivery
- Context aware and responsive service rendering
- Coherent Orchestration and Execution of Services
- Agile solutions with dynamic composition of service building blocks
- Higher plane of abstraction for lower grained services

TRACK B: Modeling and IDEs

1400 – 1700   Session 4B: *IDEs and Modeling Tools*

This session offers a sampling of IDEs and modeling tools from the open source community supporting the software development process. Presented will be a tool supporting management of XP projects; the use of UML 2 and related open source technologies to build the next generation of modeling tools and IDEs; deploying OMG standards and open source software in modeling multiple kinds of information systems; and the use of Eclipse as an IDE integrated development platform.

XP4IDE: Applying XP Practices to Project Management
Allesandro Soro, Researcher , CRS4

In this presentation we describe an open source tool called XP4IDE. XP4IDE connects to an eXtreme Programming project management tool and provides the developer with a view, directly integrated into the IDE, of process data, user stories, tasks, acceptance tests and artifacts (classes, documentation files, test cases, etc.) managed and saved by the project management tool. On the other hand, it measures the specific time spent on user stories, tasks and artifacts and sends this information to the project management tool, automating the tracking activity.

Metamodels and Modeling Multiple Kinds of Information Systems
Randall Hauch, VP Development & Chief Architect for Metadata Management, MetaMatrix

Information and data is represented many ways, even as the same information is passed from system to system. Tracking the technical and semantic details about how information is used and shared throughout an enterprise is challenging but more important than ever. Formally modeling the information provides significant benefits, but has been difficult in the past because of the different types of information systems. This talk will describe how a single

modeling environment can use domain-specific metamodels and open-source components to make it easy for people to describe, visualize, modify, discover, track, relate, and make better use of their enterprise information.

Leveraging UML 2 and Open Source Technologies to Build Next Generation Modeling Tools and IDEs
Kenn Hussey, Eclipse UML2 Project Lead, IBM

The UML2 project (an Eclipse Tools sub-project) is an EMF-based implementation of the UML 2.0 metamodel for the Eclipse platform. The objectives of this project are to provide a useable implementation of the metamodel to support the development of modeling tools, a common XMI schema to facilitate interchange of semantic models, test cases as a means of validating the specification, and validation rules as a means of defining and enforcing levels of compliance. This presentation will discuss the status of the UML2 project and describe how companies like IBM and Omondo are leveraging UML2 and related open source technologies such as Eclipse, EMF, and GEF to build the next generation of modeling tools and IDEs.

Eclipse as an IDE Platform for Integrated Development
Gene Sally, Senior Software Engineer, TimeSys

An IDE typically consists of a code editor, a compiler, a debugger, and a graphical user interface (GUI) builder. A single interface enables the developer to simplify the day-to-day work of designing and debugging applications, kernels, and kernel modules and developing custom drivers. As part of an integrated tool set, a solid commercial IDE will automate graphical debugging, makefile management and many other features critical to development. This presentation will discuss these IDE elements and describe how Eclipse can serve as a reliable basis for an integrated development environment.

1515 – 1600   Afternoon Refreshments

1730 - 1930   *Workshop Reception*

hosted by   **Mathet Consulting**   SOSY   OMONDO *THE LIVE UML COMPANY*   SPARX SYSTEMS

THURSDAY, March 24, 2005

<u>**TRACKS A & B**</u>

0900-1030   **Session 5:** *Semantic Aspects and Ontologies for SOA and WS*

> When an enterprise links its independently-written applications into a SOA, and again when it goes beyond and links to those of its suppliers and customers, it has to look beyond syntactic interoperability to semantics and ensure that all applications agree on the meaning and significance of every parameter, data element, and operation they exchange. This is difficult enough within an enterprise; when you go beyond, the problem magnifies. In this session, we'll look at current development and standards work in ontologies and semantics and how they help enterprises achieve semantic interoperability.

The Semantic Web: Infrastructure for Next Generation Web Applications and Services.
Deborah McGuinness, Co-Director and Senior Research Scientist,
Knowledge Systems Laboratory, Stanford University.

The Model Driven Semantic Web – Emerging Standards and Technologies.
Elisa Kendall, CEO & Founder, Sandpiper Software

1030 - 1045   Morning Refreshments

1045 - 1215   **Session 6:** *Security, Performance, and Other Challenges*

> Based on ASCII and XML, the WS infrastructure is flexible and free of the machine-dependent inconsistencies in precision that would affect a byte-encoded system. At the same time, the system that integrates an enterprise internally and with its suppliers and customers through a SOA composed of WSs is expected to handle heavy invocation loads with the level of security that we expect for financial or healthcare data. How can you design a system to meet these demands? In this session, we'll investigate. At the end of the presentations, a speaker panel will explore the topic further.

Web Services Security Challenges
Hal Lockhart, Principal Engineering Technologist, BEA Systems, Inc.

Basic Web Services security mechanisms have now been standardized and significant interoperability has demonstrated among a substantial number of implementations. More advanced security specifications will be submitted for standardization in 2005. But many challenges remain. This talk will briefly overview three areas which fall outside of any current standards efforts and in some cases even beyond current research topics. The three areas are:
- risks of mis-applying Web Services Security,
- necessary security mechanisms which fall outside of standards and
- the challenges of composing security with applications and other infrastructure services.

Presentation on Scalability, Transactionality, and Performance
Replacement speaker TBA

1215 - 1300   Lunch

1315 - 1415 **Panel:** *System Design Challenges*

1415 – 1430 Afternoon Refreshments

1430 - 1600 **Session 7:** *SOA, Web Services and MDA Case Studies*

> Early adopters have SOAs based on WSs working today; the next wave of companies is well along in their implementations. In this session, we'll hear from these companies and government agencies, and the companies who worked with them, about their successful and perhaps their not-so-successful attempts at enterprise-wide integration. At the end of the session, we'll gather the speakers for a panel discussion where they'll evaluate WS in SOAs, point out their pluses and minuses, and offer advice on how your enterprise can succeed with this technology.

Architecting Government Agencies as Enterprise Systems Utilizing MDA, SOA, and WS
Matthew Hettinger, President and Chief Architect, Mathet Consulting.

This case study presents work done at the Oregon Public Employees Retirement System. It presents how the concepts of EA, MDA, SOA and WS were used to create architecture and engineering artifacts to represent a unification of agency business and technology systems in terms of a set of legally-oriented, pension based services to state employees and other state agencies. This work covered the full scope of the enterprise including strategic, tactical and operational concerns, and agency interactions with external stakeholders.

SOA at John Deere - the Good, the Bad and the Ugly
Duane Clarkson, Architect, John Deere

John Deere has used various messaging architectures over the past 20 years to integrate applications. Technical advances in integration technologies as well as increased business needs to integrate more applications have triggered us to go through yet another round of improvements in our integration architecture. In order to provide enterprise-wide application integration, our approach needs to consider our many environments. We have been standardizing application protocols, as well as selectively employing technologies such as XML, SOAP, MOF for message definitions and most recently are adding Web Services support. This session will concentrate mainly on application of these technologies for integration behind the firewall and discuss some of our internal recommended standard application behaviors to support open, flexible integration.

SOA in the Large - Lessons from the Edge
Bill Nadal, CTO, Herzum Software LLC

This talk will cover the SOA design and the component based delivery of a large scale distributed supply and logistics system for Europe's second largest pharmaceutical company. Covers one of the largest implementations of a leading web services product. The case study will provide real life experiences in achieving scalability, performance, failover, etc. It will also overview second generation architectural and MDA delivery approaches based on "post-SOA" interoperability reference models.

1600 – 1645 **Panel:** *Case Studies Lessons Learned*