

Web Services: From Technology To Reality

A Workshop On Modeling, Architectures, Infrastructures And Standards For Business Collaboration

March 4-7, 2002

Workshop Program

Monday, March 4, 2002

Tutorials

0900 1230 *Web Services and Service Oriented Architectures*
Peter Herzum, Herzum Software LLC

The tutorial provides the state of the art in the field of Webservices and Service Oriented Architectures. It addresses the most relevant standards and technologies and provides an architectural foundation for developing webservices and Service Oriented Architectures. After presenting the basic technologies (XML, SOAP, WSDL, UDDI, and XMLP) and briefly exemplifying how some commercial products are using these technologies today, the tutorial compares the support of Microsoft .Net and Sun's J2EE specification. Using a comprehensive conceptual framework, the tutorial comparatively positions the above technologies and standards, as well as other relevant standards, such as ebXML, XML/EDI, RosettaNet, and others, and discusses their applicability and maturity. The tutorial then presents other architectural challenges of webservices, 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; and more. The tutorial also analyzes the differences between components and services, how Service Oriented Architectures differs from component-based development, and how best to approach projects taking advantage of both.

1030 – 1045 - Morning Refreshments

1230 – 1330 - Lunch

1330 – 1700 *Model Driven Development of Web Services*
Sridhar Iyengar, Unisys & David Frankel, IONA Technologies

UML and MOF based technologies are paving the way for automating aspects of software development, insulating software from platform volatility, and promoting rigor and engineering discipline in the creation of large-scale systems. Learn how to apply Model-Driven Architecture principles when building web services and about the web services related standards being developed at OMG.

1500 – 1515 - Afternoon Refreshments

Tuesday, March 5, 2002

0830 – 0845 - ***Opening Remarks*** - (Program Committee Co-Chair)
Fred Waskiewicz, Object Management Group

0845 – 1015 - ***From Technology to Architecture - Considering the Business Perspective***
Chair: Jim Adamczyk, Accenture

The technologies and standards associated with web services will enable powerful applications that support existing and new business models. But they are not magic. These three speakers will present their experiences and proven practices on how to get to reality with web services by following a holistic, business driven approach.

Automating the Collaborative Enterprise Cory Casanave, Data Access

The information system is the backbone of the modern enterprise – it is as integral as the staff that builds, designs or sells our products and the physical assets the enterprises need to function. Information and the ability to collaborate have become key differentiating factors between the successful agile enterprise and the stagnate, decaying enterprise. Having information systems that enable business goals can be “life or death”. Information technology management has, for years, recognized the strategic necessity to build systems faster, more modularly and with less dependence on the infrastructure. We will present how web services fits into this picture as part of the solution.

Web Services – A Consultant’s View - From IT Strategy to IT Architecture Dr. Hans-Peter Hoidn, Dr. Timothy Jones, Jurg Baumann, Oliver Vogel, PwC Consulting

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.

Legal Considerations for Web Services, Federated Systems and E-Commerce Matthew K. Hettinger, Mathet Consulting, Inc.

Enterprises may integrate and collaborate with many other enterprises in a parallel and concurrent fashion. There are many legally oriented concerns with web services and service-oriented architectures for e-business as well as legal architectures themselves, which may be enabled by web services. These include observation, mediation, and arbitration association with intellectual property, ontology’s and semantics, service and information quality, processes, integration of applications and other web services, management, contracts, jurisdiction, non-repudiation, trading and service level agreements, and standards. Web service architectures and legal architectures for intra- and inter-enterprise integration and collaboration are dependent on the nature of the relationship between enterprises.

1015 – 1030 - Morning Refreshments

1030 – 1200 - ***Applying Model Driven Architectures to Web Services***
Chair: Cory Casanave, Data Access Technology

Model Driven Architecture (MDA) provides the link between UML (Unified Modeling Language) modeling and executable systems, bringing a consistent and unifying architecture to web services. Our experts will explain how to precisely model the enterprise and then use these models to drive the web services specification, development and deployment process. We will explore both the business case and technical realities of applying MDA to web services.

From Declarative Business Models to Web Services: An MDA Based Approach

Dr. Vladimir Bacvanski and Petter Graff, InferData Corporation

In the presentation we explore the role of MDA for design of web services and the needed transformations from domain models to web services. We first explore a set of rules for transformations between models that can be performed manually, and then the automated generation based on transformation of XMI documents generated from CASE tools. The last step in transformation is the generation of Web Services interfaces. We will share the experiences with the use of model transformers and with the development of enterprise applications in this fashion and conclude with the set of challenges and best practices for MDA-based development of Web Services applications.

Modeling Web Services with UML

Christopher C. Armstrong, Armstrong Consulting, Inc.

The Simple Object Access Protocol (SOAP), Web Services Description Language (WSDL), and Universal Description, Discovery, and Integration (UDDI) are emerging standards for describing, discovering, and invoking application services on the World-Wide Web. The speaker will review conventions for modeling SOAP/WSDL/UDDI web services using the UML, how web services fit into the 4+1 View of Architecture, and how to integrate the web services model with the component design models such as EJB, .NET, and CORBA.

Codifying Architectural Frameworks for Web Services and Federated Systems

David Zygmunt, Metanology Corporation

The presentation will cover three areas: 1) The role of MDA, the development of PIMs and the tools that translate PIMs, via, codified architecture, to implementations; 2) The positive impact on both the economics of application development and the enforcement of standards this development approach offers the enterprise; 3) The use of industry specific PIMs in the design of federated systems. How each enterprise's application within the federation uses the PIM to ensure capability with other systems in the federation, via, Web Services. How each enterprise in the federation can extend the PIM to a unique Enterprise Specific PIM (ESPIM) will be shown.

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

1200 – 1300 - Lunch

1300 – 1330 - ***SPONSOR PRESENTATION - BORLAND SOFTWARE***

1330 – 1630 ***Architectures for Federations of Business Systems***

Chair - Peter Herzum, Herzum Software LLC

Architecting, federating, and composing the new generation of federations of business systems and of webservices components requires new concepts, new patterns, and new architectural approaches. These include crisply layered and tiered architectures, direct support to the federation and composition of solutions from services that can come from anywhere on the Internet, the renewed role of components, and the important role of "contracts".

Architecting Web Service Applications

Michael Rosen, IONA Technologies

Web services are this year's hot new technology, but how do they fit into the other technologies in the enterprise and how do we build applications to maximize their potential. This presentation will clearly describe the various roles that web services can play within an enterprise, and present a multi-layered, multi-tiered architecture that addresses those different roles and successfully combines new and existing applications with web services to create an overall enterprise architecture. The session will go into detail on the layers and tiers and will also address industry trends and evolving standards that affect the architecture.

Composite Application Architecture

Sean Fitts, CrossWeave, Inc.

By providing an application-to-application communications mechanism, XML web services serve as a key enabler in the Internet's transition to an application platform. However, rapid construction of service-based applications presents challenges beyond the communication layer. Such applications are highly federated, attempting to bring together services from many domains, possessing differing characteristics to create a consistent user experience. In this talk we will present a Composite Application architecture, designed to assist in the construction of service-based applications.

Component Web Services Architecture

Anthony Wiley and Steve Battle, Hewlett-Packard

The work presented in this paper is motivated by the need for design patterns and tools which better enable the development, specification, operation and management of large scale web services and applications. With this aim in mind, we present a web services architecture based on a document centric component model. In this model, web services are constructed from a new class of objects termed web service components. The paper will outline the component web services architecture and provide examples of how web services, and associated applications, can be constructed based on this model.

1500 – 1530 - Afternoon Refreshments

Contracts for Services: Needs and Nonsense!

Mark A. Perreira, Talking Blocks

This session will show how contracts specifically written for Web Services make it possible to loosely couple heterogeneous systems via services collaborating in a truly polymorphic fashion. Web Services hosted by different providers but implementing the same contract can be dynamically swapped in a way that is transparent to the service consumer. This enables business routing, load balancing and fail-over between different providers, as well as rolling upgrades of services without downtime. We will discuss the requirements of this development paradigm, including contract specification, versioning, quality of service, and security. A real world implementation of this approach and the tools used to make this possible will be demonstrated.

Enterprise Federation through Web Services based Contracts Architecture

Sachin Kulkarni and Zoran Milosevic

CRC for Enterprise Distributed Technology (DSTC), University of Queensland

In spite of pervasiveness of business contracts in B2B collaborations, there is still lack of generic architectures to support entire life cycle of contracts, particularly in the context of web oriented business environment. In this presentation we illustrate how a commonly used financial contract service, namely Direct Debit Authority, can utilise our web services based Business Contracts Architecture throughout its comprehensive operational sequence. We also present insights gained from Web Services standards and from Web Services implementation platforms in terms of existing capabilities and architectural styles for adopting web services to federate organisations' business processes.

1630 – 1800 **Architecture for Web Services Panel**

Chair: Fred Waskiewicz, Object Management Group

A core concept of the web services architecture model is the mediation of third-party web services via a registry service to enable the automated composition or federation of web services at run-time. This panel will investigate what is required, possible, and meaningful to truly support runtime dynamic discovery, subsequent binding, and execution of software services, from both a business and technical perspective. It will address not only architectural issues but also relevant standards, questioning the direction those standards are headed.

Panelists: Efreml Lipkin, Financial Systems Architects

Ignacio Silva-Lepe, IBM

Mark Potts – CTO, Talking Blocks

Tushar Hazra - CEO/ President, EptomiOne

Ravi Trivedi - E Solutions Division, Hewlett Packard, Bangalore

Wednesday, March 6, 2002

0830 – 1030 **Technology**

Chair: Jon Siegel, Object Management Group

None of the "new technology" ideas bandied about in the discussions of Web Services, SOAP, XML-RPC, UDDI, etc., presents a truly new technology. RPC mechanisms, distributed object technologies and transactional messaging platforms have been around for years. This session will explore how to design and deploy Web Services to the "new technology" specifications by leveraging proven, existing technologies. Foundation technologies to enable robust services on the Web will be discussed and compared.

Integrating J2EE and .NET Applications with Web Services

Michael Rosen, IONA Technologies

Web services are emerging as the standard for doing business over the internet and will become an important aspect of future applications. Platform vendors are embedding and integrating them into their application platforms. However, there are two primary, competing platforms for web services, J2EE promoted by the Java Community, and .NET promoted by Microsoft. The fact that each platform offers standard web services means that at some basic protocol level, they are interoperable. But what is involved in real interoperability at the business level? This presentation will describe a strategy for integrating J2EE and .NET services and applications that address both the current state of technology and the trends occurring in the industry and standards.

Leveraging Web Services for Application Integration

David S. Linthicum, Mercator

Web services hold the promise of moving beyond the simple exchange of information to the concept of accessing application services that are encapsulated within old and new applications. This means organizations can not only move information from application to application, but they also can create composite applications, leveraging any number of back-end application services. Key to this concept is figuring out how Web services fit into the existing application integration technology and approaches. We'll look at the notion of Web services in context of application integration. We'll look at approaches, architectures, and enabling technologies that you can implement today to address the problem of application integration using the new paradigm of application service-based application integration.

Practical Experiences with Web Services and CORBA

Hugh Grant, Cape Clear Software

Web services are increasingly seen as an essential part of distributed computing. Do web services replace existing technologies such as CORBA and J2EE? Or are they complementary technologies that build upon existing systems to enable entirely new ways of communication? We will summarise the key lessons learned by Cape Clear and its customers since mid-1999. Topics to be covered will include: How web services relate to CORBA and J2EE; Using web services to widen access to existing enterprise systems; Lessons from web service integration; Building new web services: where do CORBA and J2EE fit; Future opportunities - what forthcoming web service standards and technologies will mean for enterprise users.

Web Services and Messaging Technologies

Steve Trythall, PrismTech

Two architectures are emerging for web services integration. The first is a tightly coupled approach where existing and new components are published in a UDDI repository and access through WSDL. The second approach is to integrate trading partners through messaging and the use of XML-based business documents. This presentation will present a survey of messaging technologies for web services and describe: How existing messaging technologies (eg JMS) have been adapted for web services architecture; New and emerging technologies for web services messaging, in particular JAXM and ebXML; The relationship between the content standards (eg OAG and RosettaNet) and these new messaging standards; What the future holds for web services messaging.

1000 – 2030 ***Demonstration Area Open***

1030 – 1100 - Morning Refreshments

1100 – 1230 ***Transactions Meet the Web***

Chair: Jishnu Mukerji, Hewlett-Packard

Classical ACID transactions that work well in closely coupled distributed systems do not work well in the loosely coupled world of the web. The problems that arise in the web have been addressed by incorporating subtle changes in transactions and how they are implemented. This session explores these changes and how transaction standards have evolved to incorporate them.

Transactions & Web Services

Dr. Mark Little, HP Arjuna Labs

In the traditional world of distributed objects, consistency guarantees are typically provided by transaction systems which have the well known ACID properties (Atomicity, Consistency, Isolation and Durability). However, strict ACID semantics require the use of a blocking protocol, such that resources acquired within the scope of such a transaction must remain inaccessible to others until that transaction has completed. In the world of Web Services, where business interactions may span hours or days, ACID semantics become too restricting. The Business Transactions Protocol from OASIS, is one attempt to address these issues. This presentation will describe the issues which have lead to the development of BTP. How BTP relates to the J2EE and OMG models of transactions: JTS, JTA, OTS and XA, will be discussed.

OASIS Business Transaction Protocol: Multi-party Coordination for Commercial Collaborations

Dr. Tony Fletcher, Dr. Peter Furniss, Alastair Green, Choreology Ltd

The OASIS Business Transaction Protocol is a two-phase outcome protocol designed for use in environments such as Web Services, that meets the conditions obtained in the loosely coupled fragile communication infrastructure of the web. It defines an abstract view of the multi-party coordination problem, and defines concrete mappings to particular carrier protocol stacks, encodings and special qualifiers. These mappings, or "bindings", are targeted in the first instance on Web Services: the initial bindings define BTP over SOAP/HTTP and SOAP-with-attachments/HTTP. This talk will present the design of this protocol.

Support for Long-Running Distributed Transactions

William Cox, BEA Systems, Inc.

The OASIS Business Transaction Processing Technical Committee, is addressing the issues of basic distributed atomic transactions. A business negotiation might have multiple potential successful outcomes. In a parallel with such negotiations, increasingly common usage overloads the term "business transaction" to apply to a more complex, choreographed set of atomic operations which may also have more than one potential successful outcome. If we regard atomic distributed transactions as the building blocks, so-call cohesions (in the BTP terminology) can aggregate these building blocks. This talk will explore this more speculative area in some detail, as well as the more general area of aggregation of web services.

1230 – 1330 - Lunch

1330 – 1500 **Securing the Web**

Chair: Jishnu Mukerji, Hewlett-Packard

The relatively open nature of the web and the rapid development of myriads of protocols, which has occurred in the absence of serious thought given to security, has created significant challenges in securing the web. This session addresses certain aspects of this broad problem area.

An Architecture for Integrating Security across CORBA, J2EE and Web Services

Ted Burghart, Hitachi Computer Products (Quadraxis Security)

With the rapid pace of product development focused on Web Services and the abundance of security technologies being deployed throughout the enterprise, integration of these disparate products and services becomes increasingly important in order to maintain a manageable level of complexity. This presentation illustrates the requirements for and development of an extensible, distributed framework that allows sharing of security components across multiple platforms and middleware technologies. Included are commonalities and differences between security technologies and approaches to mapping between them, as well as their implementation outside of their 'native' platforms.

Security Challenges in Architecting Web Service Solutions

Peter M. Herzum, Herzum Software LLC

This presentation will discuss : How Webservices themselves can provides a medium for the delivery of trusted services; Modeling webservices Communities in the levels of information exchange; PKI and Interoperability. Planning webservices for PKI; How XML can leverage PKI for the benefit of webservices communities; A brief analysis of the new and emerging standards, like XML Key Management Specification (XKMS), XML Signature, and Security Assertion Markup Language (SAML). A brief security-related example will be taken from a case study of a real-world project.

Web Services - Security Issues for Deployment

Gerald W. Edgar and Pranab Baruah, Boeing

Web services technology will be used in business environments requiring that resources and information be protected. In this paper we describe issues of confidentiality, integrity and accessibility of web services. These include how web services and associated standards are addressing portions of security issues; how to accomplish encryption and authentication for the selective and controlled exposure and use of services to insure confidentiality; and how to insure the integrity of the information exchanges and the actions performed. Finally, this paper addresses accessibility for as well as the prevention of service breakdown either through malicious intent or by mistakes.

1500 – 1530 - Break

1530 – 1700 **Methodologies**

Chair: Hans-Peter Hoidn, PwC Consulting

This session focuses on specific aspects of methodologies that need to be addressed when developing Web Services. Web Services solutions require slightly different approaches to methods such as Business Process Modeling and Component-Based Development than when building "traditional" IT systems. The session covers an overview that leads to a conceptual framework for a service-oriented architecture; explains how analysis and design techniques lead to service definitions; and a framework using and composing Web Services.

COSM™: An Approach to Service Oriented Architectures and Federations of Business Systems

Peter M. Herzum, Herzum Software LLC

This presentation introduced the main characteristics of an approach which builds on component-based approaches for large systems and integrates the new solutions required by Service Oriented Architectures challenges. The presentation addresses the conceptual framework required, the differences with “traditional” methodologies and approaches such as object-oriented and component-based approaches for individual systems, the specific issues of a Model-Driven Architecture for federation of business systems, and more. The presentation also distinguishes the approach for federations of business systems within a large enterprise, across enterprises, and for product suite or product line developments using webservices and Service Oriented Architectures.

Web Services: From Conceptualisation to Design

David Piper, Aonix Europe, Ltd.

Standards exist for finding and executing Web Services but they do not provide a means for understanding from first principles the structure and content of the services that will be needed. For many organisations, then, key questions must be answered before they can publish and use Web Services. Often, these questions are as primitive as what requirements can be met by Web Services?; what are the informational requirements of these Web Services?; what Web Services might be used by others?. In short, before I can discover and use a Web Service to meet my needs, I must understand those needs.

From E-Processes to E-Networks: an E-Service-oriented Approach

Giacomo Piccinelli & Eric Stammers, Hewlett-Packard

Looking at the recent history of information systems, two complementary trends seem to emerge. On the one side, systems become more modular. The shift is from tight integration to loosely coupled components. On the other side, the distance between business models and information technology (IT) is shortening. Aggressive business models impose new requirements on IT. Operational capabilities made available by IT drive the definition of new business models. Web services are the most noticeable outcome of the first trend. E-services play a similar role for the second trend. In this presentation, we concentrate on e-services and their relationships with the type of business processes used by e-businesses.

1700 – 1815 Enterprise Web Services Panel

Chair: Bill Cox, BEA Systems, Inc.,

How can web services deliver the reliability and predictability of today's enterprise middleware?
This panel will explore and assess what technologies are needed to evolve simple web services into enterprise web services, and discuss alternative requirements and technologies to satisfy them. For enterprise use, key additional requirements are (1) support for long running distributed transactions, (2) aggregation and composition of services, (3) security, and (4) reliable transport. OASIS BTP partially meets technology requirements for the first; a number of proposed web services extensions, including WSFL, XLANG, and BPML addresses the second. ebXML TRP addresses reliability in an XML transport stack, but is competing with the not-yet-complete reliable SOAP. Security admits of no simple answer (but XML DSIG and encryption are a start). Reliable http might contribute to reliability. Panel members will be drawn from leaders in enterprise middleware and web services.

Panelists: TBD

1830 – 2030 *WORKSHOP RECEPTION hosted by Borland Software Corp.*

Thursday, March 7, 2002

0830 – 1115 **Case Studies**

Chair: Jon Siegel, Object Management Group

For nascent technology areas, the most common question isn't "what?" but "how?". How do I sort out the winning technology foundations from all of the specifications on offer? Which are just specifications, and which are proven technologies with proven track records? This session will zero in on Web Services case studies, focusing not on infrastructure but rather on application-specific domain solutions. Speakers will discuss the detailed problems in their application domains, and how those problems drove their technology and product choices to deliver a solution.

Architectural Patterns in Open GIS Web Services

Rob Atkinson & Arne J. Berre, SINTEF Telecom and Informatics

OGC Web Services provide a vendor-neutral, interoperable framework for web-based discovery, access, integration, analysis, exploitation and visualization of multiple online geodata sources, sensor-derived information, and geoprocessing capabilities. The current UDDI and ebXML registry models provide a basis for business and service descriptions in the OWS registry model. The strong information- and content-oriented focus of GIS web services has led to a further development of architectural patterns for flexible information search and retrieval for general content-oriented web services, based on a dynamic binding template. The relationship to the OMG MDA approach and the ISO 19119 service specification standard of ISO/TC211 will be discussed.

Case Study in Tourism

Peter M. Herzum, Herzum Software LLC

This case study describes lessons learned from a large webservices project in the Tourism domain. The project aimed at connecting information systems and Internet-based service bus, as well as value-added services into a community where a critical mass of European resources and data can be shared in a network across a wide geography, to create a competitive advantage in the travel service provider market. The case study will present the overall architecture, the main issues encountered and the solutions proposed, including the role of registries, ontologies, of the various existing standards, and of the management of the whole infrastructure.

Web Services Deliver Value in the Oil and Gas Industry

Alan Doniger, POSC

In 2001 Q4, POSC, the Petrotechnical Open Software Corporation, in cooperation with Shell, the UK Department of Trade and Industry, and IBM, introduced oil and gas industry leaders to the opportunities presented by Web Services. A realistic pilot implementation was developed illustrating requests for information by a regulatory agency, routed through a registry, and satisfied by multiple oil company sites. This presentation will describe progress to plan and carry out beneficial implementations of Web Services in the industry, highlighting the collaborative nature of this work, the roles of the various players, and the added value from the parallel development of industry standards in the areas of vocabularies, schemas, and service nomenclature.

1000 – 1015 - Morning Refreshments

Using XML Web Services for Information Exchange in America's Shipyards

Thomas Daggett & Margaretha Price, General Dynamics Corporation, Electric Boat Division

As part of the Integrate Shipyard Environment project, Electric Boat is developing a number of Web Services specifically designed to facilitate the exchange of information between shipyards and their business partners. The work is focused on developing an information exchange architecture that at its core will consist of a common set of Information Models for describing shipyard engineering data and a common set of Web Services for information exchange. The Information Models being developed are defined using XML Schema while the Web Services are based upon the XML Web service approach built on the XML, SOAP, WSDL and UDDI specifications.

OMG ARAP - The MDA Approach to a Finance Web Service

Dr. Arne J. Berre, SINTEF Telecom and Informatics

The OMG General Ledger specification has recently been proposed extended by an ARAP (Account Receivable- Account Payable) facility. The initial submission presented in November 2001, was done in the traditional OMG style with CORBA IDL, but the revised submission is currently being done following the MDA approach through the use of modeling concepts from UML for EDOC and input from the recent UML 2.0 proposals. The presentation will report on experiences and issues in doing the platform independent model, and targeting various platforms, including CORBA, J2EE/EJB, Web services with WSDL and ebXML.

1115 – 1215 Ontologies and Semantic Aspects for Web Services

Chair: Peter Herzum, Herzum Software LLC

A critical brick of the process that will bring Web Services from technology to reality is the definition and standardization of the semantic aspects of the information exchanges between organizations and enterprises. Knowledge management, ontologies, semantic interoperability, and methodologies that supports them are a necessary prerequisite for the achievement of the expected Web Services-based business collaboration. This session addresses this important perspective, and also addresses how UML can be used in the ontology context.

Applying UML to Model Web Service Ontologies for the Semantic Web

Dr. Prasanta Bose - Dr. Paul Kogut, Lockheed Martin & Mark Woodward, Stanford University

The DARPA Agent Markup Language (DAML) Program is developing a language called DAML+OIL to represent ontologies for use by software agents on the Semantic Web. A coalition of DAML researchers is developing DAML-S, which is a DAML ontology that is designed to support full automation of web service use by providing enough information for an agent to find, select, execute and intelligently compose services. This presentation describes experiments in the application of UML-based ontology engineering tools to model web services with DAML-S. The focus of these experiments is on complex scientific services in the satellite imagery domain.

Ontologies for Web Services

Mark Dutra, Sandpiper Software, Inc.

Ontologies can enhance the functioning of the Web in many ways. They can be used in a simple fashion to improve the accuracy of Web searches. More advanced applications will use ontologies to relate the information on a page to the associated knowledge structures and inference rules. We have extended the Unified Modeling Language (UML) to enable collaborative ontology construction by creating a UML profile for frame-based knowledge representation that makes use of UML's extension mechanisms. We have also implemented an add-in to Rational Rose that supports this profile. In this paper, we show how rich ontological knowledge can support the development of truly collaborative web applications.

1215 – 1315 - Lunch

1315 – 1445 **Standards Support for Web Services**

Chair: Fred Waskiewicz, Object Management Group

Establishing standards for web services enhances the credibility of the technology (moving us further along the track to "reality"), reduces risk for consumers and suppliers alike and enables reuse and interoperability. This session explores standards activity in the W3C (XML, SOAP) and OASIS (interactive application access.) It also offers an argument for the need to standardize the interface and protocol between managed services for smoother interoperation.

Web Services at W3C

Hugo Haas, W3C

In September 2000, the W3C XML Protocol Working Group was chartered to produce an XML-based protocol. The protocol being designed, SOAP Version 1.2, is a technology central to Web services. W3C also organized in April 2001 a workshop on Web services in order to gather advice about which further actions should be taken in this area. This talk will give an update about the work going on at W3C related to Web services.

Proposing Web Service to Web Service Management Standards

Akhil Sahai & Vijay Machiraju, Hewlett-Packard

To enable the web services paradigm, a set of protocols and interfaces are being agreed upon. While all of these will enable seamless integration and inter-operation between web services there are aspects that need to agree upon in order to interoperate. An important aspect will be manageability from a peer service's perspective. From a consumer's perspective, a provider service is manageable if the latter offers sufficient visibility and control over itself and over the interactions it executes. From a provider's perspective, a consumer service is manageable if it can offer enough information about its service usage back to the provider. Standard interfaces need to be defined so that web services are properly managed.

Overview of the New OASIS Standards Activity on Web Services for Interactive Applications

Charles Wiecha, IBM

OASIS recently announced its members have formed a new Technical Committee to create a Web services standard for interactive application access. This committee will provide a co-ordinated set of XML vocabularies and Web services interfaces that allow companies to deliver Web applications to end users through a variety of channels: directly to a browser, indirectly through a portal, or embedded into a third party Web application. This presentation will give an overview of the business requirements and technologies underlying the new standards activity, and outline the milestones adopted by the technical committee as it kicks off its work.

1445 – 1500 - Afternoon Refreshments

1500 – 1630 **Future of Web Services: Frameworks, Deployment Issues and Tools**

Chair: Robert Marcus, Emerging Technology Strategies

This session will present snapshots of the future directions of Web Services from several different perspectives. All of the presentations are focused on the conference theme of "Moving from Technology to Reality". The first talk will describe an important new "Grid Services Framework" that brings together leading edge Grid technology with Web Services. The second presentation will cover the critical real world issues in enterprise deployment of Web Services. The last talk will describe a new type of tool that could play a key integration role in next generation XML architectures.

A Grid Services Framework

Ian Foster, Jeff Frey, Steve Graham, Carl Kesselman, Jeff Nick, Steve Tuecke
Argonne National Laboratory/University of Chicago/IBM/USC Information Sciences Institute

The Web services approach to distributed computing defines standard applications of XML for defining, deploying, discovering, and invoking network-accessible services. However, a number of features that have proved important in more complex distributed applications are not supported directly in the current Web services framework. Much of this missing functionality has been developed recently within the Grid community and distributed as components of the Globus Toolkit. We describe here how selected Grid capabilities can be integrated with Web services to create what we term a Grid Services Framework. We describe the key components of the framework and present experiences obtained with a prototype open source implementation.

XML Spaces - Beyond Web Services

Patrick Thompson, Rogue Wave Software

XML Spaces is a new communication paradigm that brings together tuple spaces, XML, the Internet, security, and web services to create a simple yet powerful substrate for rich document exchange. XML Spaces extends the web services model with looser coupling, abstract addressing, asynchrony, arbitrary XML support, many-to-many interactions and document level security. XML Spaces supports ad-hoc collaboration seamlessly within an organization or across the Internet. We will introduce the technology and describe how it can be applied to a wide variety of applications

Web Services - Issues for Deployment

Gerald W. Edgar and Pranab Baruah, Boeing

In this paper we describe considerations needed for web services to fulfill their potential of connecting diverse applications across platforms - supporting a service based architecture in a large corporation. These include what infrastructure – tools, guidelines and support - needs to be provided for developers, how to help developers in defining information structures for services, how to expose services, as well as how to catalog and register them. The paper also addresses how to deal with the transition from current application architectures to a service based architecture to avoid the cost of complete re-writes of applications.

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A Workshop On Modeling, Architectures, Infrastructures And Standards For Business Collaboration

PROGRAM COMMITTEE

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Fred Waskiewicz, Object Management Group

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