



IBM Web Services for On Demand e-business

Maximizing Opportunities Today Through the Industry's Broadest Support for Web Services

IBM Web Services
IBM Software Group

The Web services "movement" is unfolding, becoming the fabric of how you build, connect, and integrate applications, servers, and devices. IBM is a driving force behind the evolution of enterprise-ready Web services that address today's business challenges and needs for integration and openness.



Building For an On Demand World ... Today

As we build towards an on demand world, Web services are key technologies that IBM is using today via products like IBM WebSphere Application Server to help our customers become on demand e-businesses. Our latest product announcements embrace IBM's strategy for On Demand computing. First, let's discuss the strong linkage between Web services technologies and the business integration challenges of today as companies move into On Demand computing. This is happening today across small, medium, and large businesses towards the objectives of shorter-term return on investments with the leveraging of existing assets and existing skills. Web services technologies help drive our proven product portfolio into On Demand solutions. Next, we'll explain what's new with a major new version of our WebSphere Application Server – generally available on February 21 and providing cutting-edge Web services capabilities on a proven and powerful J2EE (Java 2 Enterprise Edition) foundation. But that is only the beginning, as we have Web services capabilities across many of our products now ... giving us the broadest and most productive Web services platform in the industry. Finally, to supplement our On Demand product line, we have four new programs geared towards giving you and your customers the know-how to be successful by utilizing Web services technologies with key IBM products.

As we merge Web services technologies into our products we can demonstrate how WebSphere is the foundation for the IBM e-business On Demand operating environment. And we are providing this today with the broadest Web services platform available in the industry. At IBM, we strive to lead in the creation, development, and manufacture of the industry's most advanced information technologies, including computer systems, software, networking systems, storage devices, and microelectronics. Our worldwide network of IBM solutions and services professionals, in conjunction with our many business partners, translate these advanced technologies into business value for our customers. For software, IBM is a driving force behind the evolution of enterprise-ready Web services that address today's business challenges and the needs for integration and openness.

The Web services "movement" is unfolding, becoming the fabric of how you build, connect, and integrate applications, servers, and devices. While On Demand e-business becomes the end-game for many, Web services provide the dynamic, fast path to it. **Web services are the threads in the On Demand model, weaving the common fabric that ties dissimilar resources into a stronger unified platform for both reducing costs and maximizing opportunities for growth in business.**

Maintaining competitive advantage in today's changing business environment requires companies to respond quickly to customer demands, market opportunities and external threats. Very often this means making frequent updates to e-business applications to reflect changes in market conditions or to provide access to strategic information. Unfortunately, these updates usually take a great deal of time. Time to bring down the application, time to make programming changes, times to test the new application, and time to redeploy. The cornerstone of IBM's broad platform for Web services is its WebSphere software, providing a powerful next-generation application deployment platform with WebSphere Application Server, intuitive development tools with WebSphere Studio, end-to-end management with Tivoli Application Manager, adaptable Web services applications with WebSphere Business Integration, and user interactions through WebSphere Portal Server.

We all know how the market spaces that we each deal with – no matter what industry you might be working in – continue to evolve, while we have to react to those changes. In these up-and-down economic times and with a growing cross-industry need to integrate businesses,



applications, and processes – businesses are looking to address two very significant business requirements:

1. Protect and preserve existing investments, business assets, and enterprise systems
2. Preserve and leverage existing skill sets across developers and IT operations

These basic requirements are the essence of IBM's strategy for On Demand computing in today's business world.

Web services change the economics for ISVs and systems integrators, providing a simpler, less expensive approach that allows customers to tackle projects once considered cost-prohibitive. Web services help leverage existing system assets and developer skills, while opening new business model possibilities. Web services augment existing business integration styles and solutions and make up a critical step on the path to e-business on demand, while new tools help speed development and integration through automation. These open standards and technologies allow us to describe and deploy applications or services on a network in a consistent way so that they can be discovered and invoked in a secure and reliable manner. It is likely that a given web service will be employed as part of a larger set of transactions or involved in a business process/workflow with many activities.

Web services technologies have definitive applicability across platforms, operating systems, and enterprises. These are the real benefits, where the need for correspondence and cross-system communications strongly exists. IT consultants are most likely to encounter a wide variety of incompatible technology platforms across businesses and enterprises. To avoid an incredibly large expense of rewriting applications or conforming to single, common servers or systems, there is a compelling advantage in utilizing a common format and a common set of rules for machine-to-machine interactions. These technologies must be flexible enough to accommodate a wide variety of differing operating system platforms and application server systems. Enterprise architectures have developed over time assuming that most of the coordination activity would occur within the inner workings of the enterprise and that few links would be required to other enterprises. The early adoption of Web services enables flexibility in linking enterprises to other enterprises using common formats and a common language.

IBM's proven portfolio offers the broadest support for enterprise-ready Web services in the industry today. While On Demand e-business becomes the end-game for many, Web services provide the dynamic, fast path to it. Web services help address both of these needs while providing a thin, universal layer for common communications using a consistent and standardized interface allowing for integration across platforms, operating systems, and applications. Supplementing that, IBM provides many resources and services that enable partners and customers to be successful through knowledge – thereby reducing costs of integration, shortening development cycles, greatly increasing productivity, and growing interoperability among your networks, partners, and resources. The end result is not only better and quicker returns on your investments, but also the means to optimize and maximize your opportunities to provide a cohesive strategy for communications and growth in your business and specific to your industry needs.

Let's start with a brief introduction describing the aches and pains of businesses today in changing markets. We'll link the integration needs of On Demand computing with the Web services implementations and resources available *now* that address those needs.



IT Infrastructure Pain Points ... Trying To Do More With Less

In order to address your changing market spaces while dealing with declining resources, it is important to be able to balance your IT costs, leverage existing investments in IT infrastructure, and still be able to address the needs of your business. So what business challenges exist today? It's a given that today's world is heterogeneous -- whether you are conducting e-commerce across the Internet, integrating applications inside your firewall, extending your business processes across the Internet to your partners, trying to create a "real-time" enterprise, using e-utilities or a grid, or doing service engagements. You can count on having to interact with multiple server platforms, operating systems, APIs, and programming environments. Today, the challenges that many of our customers face include business-to-business integration ... as an IT manager, I want to do business across the Internet with my customers, partners, and suppliers without having to know the intimate details of how they built their IT systems. For enterprise application integration, I want to integrate my custom and packaged enterprise applications using common tools, standards, and integration infrastructure, while not discarding my existing IT investments. Using enterprise-ready services within a services-oriented architecture, I want to allow my computing resources to be accessed and shared across a heterogeneous wide area network while delivering Qualities of Service transparently. Because we (and the rest of the world) are not about to throw away our existing IT investments, we need evolutionary infrastructure technology to tie these systems together. It's fine to introduce new technology, but it needs to work with and extend what we've got to make businesses work better – this is at the crux of *e-business*.

Few large enterprises believe they can be competitive in the long term without the internal and external business process integration that will enable them to better satisfy their customers, increase productivity and reduce costs. Our research shows that by 2005, spending on integration will represent 40 percent of all e-business spending. In hard dollars, that's about US\$200 billion by 2005, more than double what was spent in 2002.

When we look at the various disciplines we see a range of challenges, aches, and pains that each person in an organization is dealing with. From the high-level executive to the developer and architects, a common underlying theme is enabling preservation of existing systems, assets, and skills while adapting to changes in the needs of the marketplaces being served. As it relates to Web services and related technologies, we can describe the interoperability and the fit for each discipline while addressing their specific business needs:

- **CIO or IT Executive**

This person is looking at how to position the company and its products well in the marketplaces that have been chosen. With business goals in mind, how can we share services and processes across organizations and across business partners?

- **COO or IT Operations Manager**

This person is concerned with profit and loss goals as well as how to react to changes in the market. How can we invoke systems management, control growth, manage execution, and manage deployment of our services?

- **CEO or Business Executive**

This person is primarily concerned about customer as well as partner relationships, while reacting to market changes. How can we use Web services to build reliable, secure, adaptable, and automated business processes and partner interactions?



- **CFO or Financial Manager**
This person is looking to maintain and increase financial performance while meeting business goals. How do we leverage existing investments and assets within budgetary constraints?
- **CTO or IT Architect**
This person is concerned about application reliability, security, and availability within a services-oriented architecture. How can we enhance the infrastructure with a component architecture, translating applications to cross-platform services?
- **IT Development Manager**
Along with project deadlines, the IT development manager is concerned with increasing developer productivity and leveraging existing developer skill sets. What are the right tools that leverage skills and increase productivity?
- **IT Developer**
This person is concerned with component interactions, application interoperability across platforms, and application availability. What are the best and most intuitive tools to use? What case studies or scenarios exist which define best practices?



Bridging The Gap Between Business Transformation and IT

The complexities of IT infrastructure within many medium to large companies today illustrate the need for simplicity. Every aspect of your business deals with a distinct set of business processes, from product lifecycle management to procurement to category management to supply chain management to managing partner relationships. The balancing act of business transformation through business process automation and the ability to leverage existing IT infrastructure sophistication is extremely important in order to realize shorter-term returns on investments and faster time to market. This is essentially what e-business On Demand is all about. The universal IT "glue" that helps us leverage assets and skills while enabling interoperability among platforms, processes, and systems are Web services open technologies.

Web services change the economics for ISVs and systems integrators, providing a simpler, less expensive approach that allows customers to tackle projects once considered cost prohibitive. Web services help leverage existing system assets and developer skills, while opening new business model possibilities. Web services augment existing business integration styles and solutions and make up a critical step on the path to e-business on demand. New Web services tools help speed development and integration through automation. Web services standards and technologies allow us to describe and deploy applications or services on a network in a consistent way so that they can be discovered and invoked in a secure and reliable manner. It is likely that a given web service will be employed as part of a larger set of transactions or involved in a business process/workflow with many activities.

So, what is an e-business on demand business? IBM defines it as "an enterprise whose business processes--integrated end-to-end across the company and with key partners, suppliers and customers--can respond with speed to any customer demand, market opportunity or external threat." For an organization, it means the ability to satisfy customers who want products and services that are customized dynamically and delivered in real time.

It means the ability to provide employees, suppliers and partners with the information and insights necessary to do a better job - and to do the job faster and cheaper. It's the ability to reconfigure a supply chain based on schedule or price or location - whatever makes sense at the time - because the core infrastructure has the flexibility to support integration with an ever-changing spectrum of suppliers.

- **Integration:** Integral to cross-enterprise communications and adaptable applications, business integration is necessary for survival in today's changing markets. Through integration, you are more capable of sensing changes in the environment and responding dynamically, whether to unpredictable fluctuations in supply or demand, emerging customer, partner, supplier and employee needs, or unexpected moves by their competition.
- **Open Standards:** Openness allows for interoperability across diverse platforms, systems, and enterprises. Implementing open standards allows you to adapt cost structures and business processes flexibly, reduce risk and drive business performance at higher levels of productivity, cost control, capital efficiency and financial predictability.
- **Virtualized:** Committed to concentrating on core competencies and differentiating tasks and assets; On Demand businesses use tightly integrated strategic partners to manage tasks ranging from manufacturing, logistics and fulfillment to HR and financial operations.



- **Autonomic:** IT infrastructure needs to have facilities for self-tuning and self-healing, while being fully prepared for changes and threats -- be they computer viruses, earthquakes, or sudden spikes in demand.

The On Demand operating environment can now be defined by combining the diverse systems environment on the low end with the high-end applications and business processes being used, enabling the linkages via a middleware platform flexible enough and open enough to enable a broad range of communications, adaptability, and services.

Web services technologies have definitive applicability across platforms, operating systems, and enterprises. These are the real benefits, where the need for correspondence and cross-system communications strongly exists. IT consultants are most likely to encounter a wide variety of incompatible technology platforms across businesses and enterprises. To avoid an incredibly large expense of rewriting applications or conforming to single, common servers or systems, there is a compelling advantage in utilizing a common format and a common set of rules for machine-to-machine interactions. These technologies must be flexible enough to accommodate a wide variety of differing operating system platforms and application server systems. Enterprise architectures have developed over time assuming that most of the coordination activity would occur within the inner workings of the enterprise and that few links would be required to other enterprises. The early adoption of Web services enables flexibility in linking enterprises to other enterprises using common formats and a common language.



IBM's Integrated Middleware for e-business On Demand

IBM's proven product portfolio spans five brands which make up the middleware integration platform. Rational now provides us with a powerful set of modeling and development tools; Tivoli includes systems and application management; Lotus brings to the table collaborative services; DB2 adds information integration and data management; while WebSphere provides the foundation for managing transactions and messages, reliably and securely.

Today's business challenges define the needs for what we call a next-generation platform that can be open to diverse and dissimilar system assets while adapting to new platforms. So what do we mean by a "next-generation platform"?

A next-generation platform streamlines integration tasks by leveraging the power of Web services for building on-demand, network-based applications:

- Employs a service orientation to dynamically integrate IT assets within and across enterprises
- Choreographs interactions between reusable services with a fully integrated Web services workflow engine
- Enables advanced transactional connectivity to coordinate interactions with multiple back-end systems across the network
- Provides intelligent, out-of-the-box compensation capabilities to rollback multiple transactions in reverse order if a failure should occur later in a business process

A next-generation platform accelerates on-demand application development tasks:

- Offers a highly integrated application development environment for building workflows, J2EE artifacts, Web services and sophisticated application adapters based on Eclipse
- Delivers J2EE and Web services innovations to tackle some of today's toughest coding challenges
- Reduces time to market by promoting the reuse of services in new applications and by minimizing the disruption in existing applications when changes to individual services are required
- Includes agile deployment capabilities offering developers the tools to optimize performance without impacting source code

A next-generation platform enables the real-time application flexibility required for on-demand applications:

- Leverages business rules to create adaptive applications that can quickly respond to changing business conditions
- Allows the development of flexible applications with which users can dynamically interact by building and submitting queries at runtime.



Delivering the Industry's First Application Server Support For Building and Deploying Choreographed Web services and Legacy Assets With Transactional Connectivity

As cornerstones for IBM's broadest Web services platform in the industry today, two WebSphere products were recently made available. WebSphere Application Server Enterprise Version 5 simplifies application integration with Web services while enabling secure business interactions within and across enterprises. WebSphere Studio Application Developer Integration Edition for Linux and Windows Version 5 accelerates large-scale application development using Web services, while enabling secure user interactions with enterprise assets regardless of the platforms involved.

While On Demand is quickly becoming the next generation of business across industries, IBM is providing TODAY the next generation Web services platform for today's needs for an open, flexible, and integrated operating environment. IBM WebSphere Application Server Enterprise Version 5 gives you a powerful, ultra-secure, open deployment environment for running today's applications and includes advanced support for Web services. This next-generation application server provides extensions to the J2EE application programming model with optimizations for application deployment. It provides advanced integration capabilities for composing and choreographing adaptable applications – all based on a progressive Web services-oriented architecture. IBM WebSphere Studio Application Developer Integration Edition Version 5 for Linux and Windows gives you a flexible Integrated Development Environment for building e-business applications as Web services. This paper focuses on these two products today, which provide the cornerstones for a well-integrated and open infrastructure for On Demand e-business.

In conjunction with the availability of these foundation products, we are providing a wealth of resources and services that you can leverage today to enable you as partners and you as customers to maximize your opportunities for rapid results, cost reductions, flexible computing environments, and growth.

Based on the research we've done, we've seen a definite pattern in the way companies begin and continue their journeys to becoming e-business on demand organizations. We know more about the e-business journey than any other organization in the world--because we track thousands of e-business initiatives worldwide, totaling more than 20,000 in 2002 alone. 33,000 companies were surveyed in IBM's e-business Adoption Study, and what we've found is that organizations who are working toward e-business adoption typically experience three stages.

They begin by enabling access to the Internet, by taking e-mail for granted as a means of communication. They publish a Web site and inform the world of their presence. They may even begin to use simple Web transactions to better serve their customers. This is the Access stage, and the organizations who reach this point are well on their way. But it takes perseverance to push on past fears and doubts, and to see a return on the investment.

Those who do persevere find themselves needing to simplify and streamline the processes behind the Web transactions. In this second stage "Enterprise Integration" organizations set the groundwork for future success, and begin to pull ahead of their competitors. Now, not only can customers order online, but integration work on the back end ensures that these orders flow seamlessly through the fulfillment systems - more quickly and with less intervention. Once



internal processes and systems have been addressed, an organization can move beyond its boundaries to integrate with key suppliers and partners.

Having laid the foundation, an organization can then fundamentally transform the way it operates. This last stage is called e-business on demand, and it allows the organization's leaders to see and manage operations in a coordinated, dynamic way.

WebSphere Application Server Enterprise, V5

Simplify application and services development and deployment

- Service-oriented architecture reduces complexities while promoting reuse (by representing applications as services)
- Advanced Web services support includes a private UDDI registry and a Web services Proxy/Gateway that enables Web services invocation by users from outside the firewall with the benefit of robust security protection
- Advanced Web services management allows the Gateway to serve as a bi-directional control point for critical tasks such as validation, logging, transformation, auditing, and metering; includes an XML-enabled Tivoli Performance Viewer
- Industry-leading Web services technologies, including Web Services Invocation Framework (WSIF) for deployment across a variety of network and transport protocols, and Axis 1.0 for performance-tuned, high-speed Web services deployment

WebSphere Application Server Enterprise also leverages business rules in the creation and deployment of adaptive applications that can quickly respond to changing business conditions. By generating and managing business rules beans, direct mapping exists back to the application server or system that is being connected to. This mapping can help the business rules bean react to changes in data locations or formats within the back-end system dynamically and quickly, thus being able to adapt to changing conditions in the IT systems. These flexible applications can also allow users to dynamically interact with back-end ERP systems and databases by building and submitting queries dynamically and at runtime. The combination of business rules, adaptive applications, and dynamic queries enables real-time application flexibility required for On Demand computing.

WebSphere Studio Application Developer Integration Edition for Linux and Windows, V5

Accelerate application and services development

- Integrated workflow along with Business Rules support increases development productivity and promotes reuse by enabling developers to visually choreograph interactions and automate business processes between software assets
- Advanced transactional connectivity allows generation of rich, open, Web services-based application adapters for popular Enterprise Information Systems such as IBM CICS and SAP
- Enable “next generation” development by extending resource adapters with Web services create enterprise-ready Web services from application artifacts such as adapters, Enterprise JavaBeans™ components, Flows, or JavaBeans™ components

IBM WebSphere Application Server Enterprise Version 5 is our most advanced web application server for On Demand business needs today. As it subsumes WebSphere Application Server, Network Deployment Version 5 it includes a powerful Web services application deployment environment already, while adding to it with new advanced Web services support. This combination of features simplifies business integration tasks for real-time application flexibility. The features inherited from WebSphere Application Server, Network Deployment V5 include:



- XML-based Tivoli Performance Viewer
Previously named Resource Analyzer, this feature offers smart auto-tuning to simplify the administrator's job by automatically making recommendations to tune critical WebSphere parameters for maximized performance. Tivoli Performance Viewer also collects key performance metrics and stores them as XML files which can be analyzed by a variety of tools available from IBM business partners. Tivoli Performance Viewer saves time while enabling improved application performance.
- Apache SOAP 2.3 (upgraded in V5, also known as Axis 1.0)
Axis provides high-speed Web services technology that processes Web services SOAP requests three to four times faster than was previously possible.
- UDDI4J V2 (upgraded in V5 for privacy support)
The Universal Description, Discovery, and Integration (UDDI) Registry is a repository that allows storage of business units that describe basic services. UDDI helps users find information about Web services acting as a directory of services, enabling developers to publish and test your internal e-business applications in a security-enhanced private environment.
- Web Services Invocation Framework (WSIF)
Version 5 supports two new Web services technologies developed by IBM and donated to the open source community: Web Services Invocation Framework (WSIF), a technology for developing Web services across a variety of network and transport protocols, from HTTP to instant messaging, regardless of how the Web service is implemented and accessed; and Axis 1.0 (listed above), high-speed Web services technology that processes Web services SOAP requests three to four times faster than was previously possible.
- Web Services Gateway coupled with the UDDI private registry
Web Services Gateway reduces development costs to make selected services available to different divisions within an enterprise, either outside the firewall or using different protocols. With the Web Services Gateway developers and IT managers can "externalize" a Web service so that it can be invoked by users from outside the firewall with the benefit of robust security protection.
- JSR 109/101 (technology preview)
- WS-Security (technology preview)

Now, in addition to those features above inherited from the Network Deployment edition, we round out the advanced Web services support with the following new features:

- Integrated workflow using Web services with Business Rules
With WebSphere Application Server Enterprise, V5 and WebSphere Studio Application Developer Integration Edition, V5, developers can now create Web services out of existing J2EE applications or non-J2EE assets and define workflows which integrate together. They also provide the ability to build these new applications and rapidly expose them for reuse with other applications as Web services. For example, the visual workflow tools can be used to combine inventory information from a packaged ERP application and J2EE components from a previously built customer-facing application with new business logic to create a new Web-based order entry application. The reach of the application can then be extended by exposing it as a Web service for use by business partners or to allow manual intervention for exception handling. The result is faster development of new applications, improved consistency, and lower costs. IBM WebSphere is making it easier and more productive to work more cohesively across the enterprise.
- Secure Web services management by extending the Web services Gateway with support for filter programming
Web Services Gateway reduces development costs to make selected services available to different divisions within an enterprise, either outside the firewall or using different protocols. With the Web Services Gateway developers and IT managers can "externalize" a Web service so that it can be invoked by users from outside the firewall with the benefit of robust security protection. WebSphere Application Server Enterprise extends the Web Services



Gateway with support for a filter programming model fully enabling the gateway to serve as a bi-directional control point for critical tasks such as security, validation, logging, transformation, auditing, and metering.

- Service orientation to reduce complexities while promoting reuse by representing applications as services

WebSphere Application Server Enterprise, Version 5 utilizes a services-oriented architecture approach to building new Java applications which leverages open standards to represent virtually all software assets as services including legacy applications, packaged applications, J2EE components or Web services. This approach provides developers with a standard way of representing and interacting with software assets without having to spend time working with unique interfaces and low-level APIs. Furthermore, individual software assets become building blocks that can be reused in developing other applications, unlike other proprietary solutions. Using this new service-oriented approach to integration, WebSphere Application Server Enterprise and WebSphere Studio Application Developer Integration Edition help reduce the complexity, cost, and risk of integration by providing a single, simple architectural framework based on Web Services in which to build, deploy, and manage application functionality.

- Web services internationalization (technology preview)

With WAS Enterprise v5, we are extending our i18n service to also facilitate the propagation of internationalization information across web services. This tackles the issue of ensuring, for example, that a web services consumer and a web services provider in different time zones and in different locales don't mix up times, date formats, sort orders, etc.

WebSphere Application Server

Business Challenges

- Leverage, extend, and protect existing assets, systems and infrastructures
- Reduce operating costs and increase operational efficiencies
- Connect internally and externally across diverse environments

Value Differentiators

- IBM delivers the most comprehensive and cohesive Web services platform
- Most open middleware infrastructure integrates and leverages multiple enterprises and back-end systems
- Most trusted supplier of secure infrastructure

Results

- Improved partner and customer communication
- Increased operational efficiency and internal communication
- Reduced time to market
- Improved competitive advantage

For WebSphere Studio, as the Integration Edition subsumes WebSphere Studio Application Developer it also inherits a number of key features related to Web services:

- Apache SOAP 2.3 (upgraded in V5)
- Web Services Description Language (WSDL) support (upgraded in V5)
- Publish services to UDDI V2 (private and public UBR, upgraded in V5)
- Web Services Inspection Language (WSIL) support for Web services discovery
- Web Services Invocation Framework (WSIF) support for SOAP over HTTP, RMI over IIOP, and JMS (Java Message Service)



The Integration Edition also adds new Web services related features in a well-integrated, open development environment:

- Integrated workflow for Web services applications with Business Rules support
- Advanced transactional connectivity support allows generation of rich, open Web services-based application adapters
- Resource adapter extension capability with Web services to create enterprise-ready Web services from application artifacts such as adapters, EJB components, Flows, or JavaBean components.

WebSphere Studio

Business Challenges

- Reduce cost of integration
- Leverage existing skill sets
- Lower costs by maximizing developer productivity

Value Differentiators

- IBM delivers a highly integrated and extensible environment with complete range of roles-based tools
- IBM's evolutionary approach to the development of Web services enables developers to leverage existing applications and reuse software components.
- Broadest support of open standards allows developers to more easily integrate code, hardware and software across disparate systems on a proven J2EE foundation
- IBM supports more hardware and operating system platforms than any other vendor giving developers the freedom to develop on their platform of choice

Results

- Increased development productivity
- Decreased IT spend
- Speed to market

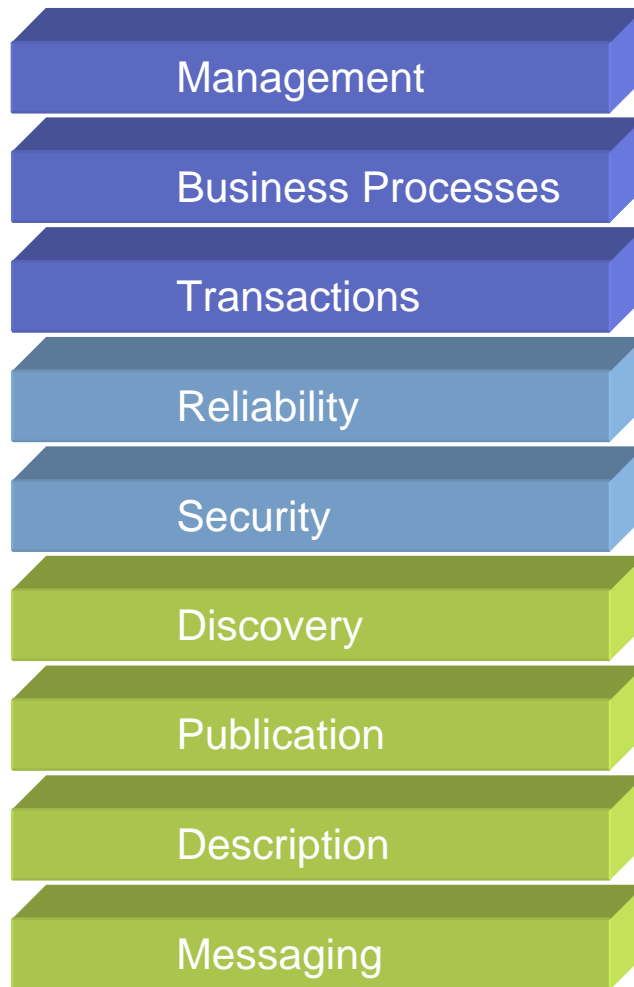


IBM's Open, Modular, Flexible Web services Architecture ... the Industry Leader In Supporting Open Standards and Open Source

It's a given that today's world is heterogeneous ... whether you are conducting e-commerce across the Internet, integration applications inside your firewall, extending your business processes across the Internet to your partners, trying to create a "real-time" enterprise, using e-utilities or a grid, or doing service engagements ... you can count on having to interact with multiple server platforms, operating systems, APIs, and programming environments. Today, the challenges that many of our customers face include B2B integration ... as an I/T manager, I want to do business across the Internet with my customers, partners, and suppliers without having to know the intimate details of how they built their IT systems. For enterprise application integration, I want to integrate my custom and packaged enterprise applications using common tools, standards, and integration infrastructure, while not discarding my existing IT investments. Using enterprise-ready services within a services-oriented architecture, I want to allow my computing resources to be accessed and shared across a heterogeneous wide area network while delivering Qualities of Service transparently. Because we (and the rest of the world) are not about to throw away our existing IT investments, we need evolutionary infrastructure technology to tie these systems together. It's fine to introduce new technology, but it needs to work with and extend what we've got to make businesses work better – this is at the crux of e-business.

The Web services architecture (WSA) is built on the simple premise of a completely open environment with multiple **services requestors**, or clients, communicating with multiple **services providers**, or servers in order to gain access to a set of services. The clients and servers could reside on a myriad of differing platforms and systems. The operating environment can be further represented in three layers of increasing complexities:

- 1. Connection layer**
Here we can establish simple connectivity and access across multiple dissimilar platforms using the basic profile, or the foundation set of Web services technologies like SOAP, WSDL, UDDI, and XML. The Connection layer is represented in the below diagram by the techniques for Discovery, Publication, and Description of Web services as well as asynchronous Messaging for invoking Web services.
- 2. Security and Reliability layer**
This middle layer encompasses WS-Security and the upcoming WS-Reliability specifications that define how Web services and associated data can be linked to policy management, user protection, reliable messaging, and end-to-end security.
- 3. Enterprise layer**
This highest layer in the diagram addresses more complex enterprise issues requiring higher qualities of services, such as choreographed and coordinated transactions, automated business processes, and business impact management.



The WS-I (Web Services – Interoperability) organization is an open industry effort that works to promote Web services interoperability across platforms, applications, and programming languages. WS-I provides guidance, best practices, and supporting resources for developing interoperable Web services. IBM software strategies embrace the growth of interoperable Web services and looks to WS-I to accelerate this process. Along the way, this process helps lower costs to produce and integrate IBM products and solutions with customer and partner systems, while accelerating products and services to market by creating open solutions. IBM is supporting the first WS-I deliverables in WSDK (WebSphere SDK for Web Services), WebSphere Application Server and WebSphere Studio. WS-I's value to our partners is to minimize the cost of developing and integrating your solutions by using products that will be WS-I certified.

IBM product support for WS-I offers key value to partners and customers:

Customers:

- Want to begin to use Web services, WS-I accelerates technology adoption by solidifying the specifications used as the base
- Want us to reduce their development cost, WS-I helps by providing clear implementation and certification guidance



- Want us to reduce the risk associated with standards selection & interpretation, WS-I helps by laying down a single industry endorsed set of direction
- Want us to increase the flexibility & value of their Web services, WS-I makes Web services more accessible & integrate-able

Partners:

- Want the cost of integration minimized, WS-I conformance in our products assists in this through specifying web services implementation details prescriptively and promoting uniform implementation across multiple vendors
- Want to know they're not being locked into a single vendor strategy - WS-I conformance in our products demonstrates that this is not the case

IBM:

- Many of our strategies (mobile, grid, on-demand, etc.) are predicated on the proliferation of interoperable Web services, we depend on WS-I to accelerate this process
- We have placed continued focus on establishing IBM support of open industry initiatives, WS-I is a prime example, it's important to emphasize product support to realize this investment
- We are challenging Sun influence through a shift in marketplace focus from JCP to WS-I based on the "web services are broader than Java" message
- We are challenging Microsoft influence through continued focus on the heterogeneous nature of the marketplace, we want customers and partners focused on WS-I rather than .net
- We want WS-I focused on addressing the interoperability needs of our partners and customers, to accomplish this we need WS-I to receive requirements statements, ideally via IBM

Both IBM business partners and IBM customers can look to the WS-I organization to deliver guidelines for producing interoperable Web services, which in turn can lower your cost of system and business integration.



IBM's Open, Enterprise-Ready Web Services Platform ... Providing the Broadest Web Services Platform Support In The Industry

IBM has the broadest support for enterprise-ready Web services in the industry, as illustrated by IBM's proven portfolio. At the core of our middleware platform for integration is the WebSphere Application Server, but there is much more, as virtually everywhere software product from IBM brings advanced Web services capabilities to the forefront of e-business.

So we have discussed the advanced Web services capabilities available today with the WebSphere Application Server and WebSphere Studio. Here we include more products that make up IBM's proven portfolio and help illustrate why we have the most comprehensive Web services platform in the industry. At the core we have the WebSphere Application Server providing the flexible, secure deployment environment for On Demand applications and services. On the left we have our WebSphere Studio tools providing cohesive, integrated development environments for building On Demand applications and services. On the right we have the WebSphere Portal Server which addresses user interactions and supplies services and On Demand applications and access to consumers. With today's support in WebSphere Portal Server, these portlets can be Web services as well, providing transparent access to back-end applications and servers. The WebSphere Business Integration combined with WebSphere MQ offer asynchronous transactional messaging and adaptable application development and deployment – all using a Web services architected model. The Tivoli Performance Management products offer consistently high levels of security and data protection while enabling management and tuning of applications, Web services, and servers across enterprises. IBM DB2 Universal Database enables developers to transform stored procedures and database queries into Web services as well.

Let's look at each of these products in a little more detail by describing the advanced Web services capabilities of each:

■ **IBM WebSphere Application Server, Enterprise V5** (covered above)

The next-generation platform for integrated application deployment.

- Subsumes **IBM WebSphere Application Server, Network Deployment V5** (available Dec/2002):
 - Apache SOAP 2.3 (upgraded in V5, also known as Axis 1.0)
 - UDDI4J V2 (upgraded in V5)
 - UDDI V2 Private Registry (formerly a PRPQ)
 - Web Services Invocation Framework
 - Web Services Gateway
 - JSR 109/101 (technology preview)
 - WS-Security (technology preview)
 - XML-based Tivoli Performance Viewer
- Adds the following in Enterprise V5:
 - Integrated Workflow using Web services with Business Rules
 - Secure Web services management by extending the Web services Gateway with support for filter programming (bi-directional control for critical tasks)



■ IBM WebSphere Studio Application Developer, Integrated Edition V5

(covered above)

The next-generation platform for accelerated application development.

- Subsumes **IBM WebSphere Application Developer V5** (available Dec/2002):
 - Apache SOAP 2.3 (upgraded in V5)
 - WSDL 1.1 (upgraded in V5)
 - Publish services to UDDI V2 (Private and Public UBR, upgraded in V5)
 - Web Services Inspection Language for Web services discovery
 - Web Services Invocation Framework support for SOAP/HTTP, RMI/IIOP, and JMS (introduced in WSAD-IE v4.1; added Workflow and JCA support in V5)
- Adds the following in Integrated Edition V5:
 - Create enterprise-ready Web services from application artifacts such as adapters, Enterprise JavaBeans™ components, Flows, or JavaBeans™ components
 - Java Connectivity Architecture (JCA) tools to extend resource adapters and convert them into Web services
 - Service Flow Editor provides a visual composition tool that allows you to compose a Flow service from one or more other services
 - Integrated workflow for Web services applications with Business Rules support
 - Advanced transactional connectivity support while enabling generation of Web services-based application adapters for Enterprise systems
 - Extend resource adapters with Web services

Together, WebSphere® Application Server Enterprise, Version 5 and WebSphere Studio Application Developer Integration Edition for Linux and Windows, Version 5 deliver a next generation application server and development environment designed to deliver *on demand* e-business applications by simplifying build-to-integrate tasks, accelerating large-scale application development and enabling real-time application flexibility.

WebSphere Studio Application Developer Integration Edition, optimized for use with WebSphere Application Server Enterprise, Version 5 helps you:

- **Simplify build-to-integrate tasks** - reduce IT complexity, reuse existing resources, and automate business processes through a powerful but simplified build-to-integrate framework.
- **Accelerate large-scale application development** - leverage the latest innovations that build on today's Java™ 2 Platform, Enterprise Edition (J2EE) standards to deploy a high performance e-business infrastructure designed to cut costs, build customer loyalties, promote business agility, and gain a competitive advantage.
- **Enable real-time application flexibility** – take advantage of dynamic application support that allows you to build applications that can adapt *on demand* to the ever-changing world of e-business.

WebSphere Application Server Enterprise and WebSphere Studio Application Developer Integration Edition help companies reduce IT complexity, reuse existing resources, and automate business processes through a powerful but simplified build-to-integrate framework.

- **The service-oriented architecture** reduces the complexity of large-scale application development and promotes reuse by offering a standard way of representing and interacting with virtually all software assets.



- **Integrated workflow** increases development productivity and promotes reuse by enabling developers to visually choreograph interactions between software assets.
- **Advanced transactional connectivity** capabilities help developers avoid custom coding by providing extended transactional support for the many challenges related to integrating existing software assets with a J2EE environment.

■ **IBM WebSphere Business Integration**

■ **IBM WebSphere Business Connection**

Web services connectors:

- Web Services Gateway (from WebSphere Application Server)
- Web Services Invocation Framework (from WebSphere Application Server)
- Process-based Web services connections
- Message-based Web services connections

■ **IBM WebSphere Business Integration Adapters**

Web services application adapters

- Adapters for Web services

Today's businesses face numerous integration challenges. Internally, they must connect disparate systems to leverage their infrastructure investments, control IT management costs, support emerging industry standards and maintain system and asset security. Externally, businesses must connect with trading partners to widen their supply chain, create new services and accelerate time-to-market schedules. Improving business-to-business (B2B) relationships through process integration is a key requirement for successful companies to increase return on investment (ROI) and transform their business into an effective e-business. The IBM WebSphere Business Integration portfolio:

- Facilitates B2B process integration and data sharing for any type or size of business
- Links businesses through scalable offerings that use industry-standard and Web services protocols
- Includes process integration middleware to collaborate with trading partners
- Lets you start with a simple, low-cost Web services connection and grow to support additional trading partners and more complex business processes
- Helps reduce integration costs and enables faster deployment of new processes and services
- Offers extensible solutions as part of the IBM WebSphere Business Integration family of offerings

IBM WebSphere Business Connection software offers a comprehensive software platform that leverages advanced Web services integration technology. You can implement a successful B2B integration infrastructure that connects you to your trading partners with IBM WebSphere® Business Connection, automate your supply chain, participate in an industry-wide trading exchange, implement e-procurement, or extend new services that help lower operational costs and create new business opportunities. Your company and your trading partners can benefit from the reduced integration costs and faster deployment of new processes and services using open standards and proven technology.



WebSphere Business Connection, part of the WebSphere Business Integration family of offerings, provides a scalable set of offerings that link your business to trading partners using industry-standard and Web services protocols. WebSphere Business Connection accommodates 50 Web services-based connections and one Trading Partner Interchange (TPI)-based connection. It delivers rapid deployment by enabling a wide range of industry protocols, along with a powerful process integration engine and available library of pre-built business processes. WebSphere Business Connection Enterprise Edition accommodates 100 Web services-based connections. It enables electronic document interchange (EDI) over the Internet using a powerful process integration engine, EDI library and EDI transformation tool. Start simple with the low-cost Web services connection offered by WebSphere Business Connection Express Edition. Grow to support additional connectivity requirements and more complex business processes using WebSphere Business Connection and WebSphere Business Connection Enterprise Edition. Use WebSphere adapters to link back-end systems and applications to enhance the long-term value of your networked system.

■ IBM WebSphere Portal

Publishing of portlets as Web services.

- Supports publishing of portlets as Remote Portlet Web Services (RPWS is a predecessor of the OASIS WSRP 1.0 spec)
- Integration of RPWS services through a generic portlet proxy

IBM WebSphere Portal - Collaboration Center: To assist companies in accessing vital information and expertise in an increasingly portal-based environment, there are collaborative tools within the IBM WebSphere Portal that enable users to more easily find, communicate and work with colleagues.

The capabilities take advantage of IBM Lotus software to extend WebSphere Portal's existing collaborative functions. They allow users to interact with multiple collaboration applications – corporate white pages, organizational charts, instant messages, team workplaces and virtual meetings – quickly and efficiently to increase individual and organizational productivity. There are Web services technologies leveraged inside WebSphere Portal, such as use of the Web Service Definition Language (WSDL) and the ability for certain portlets to be made available as Web services.

Powered by Lotus software, the Collaboration Center features are fully integrated in WebSphere Portal Extend and WebSphere Portal Experience and include the following new portlets:

- **People Finder** - an online corporate white pages and organizational navigation tool that enables users to view fellow employees' contact information and title within the context of an organization's structure.
- **My Lotus Team Workplaces (QuickPlace)** - create, search and manage multiple Team Workplaces that a user belongs to in a single view.
- **Lotus Web Conferencing (Sametime)** - allow users to create, view and participate in online meetings with which they are associated.

■ IBM WebSphere MQ 5.3

Assured delivery of Web services

- Assured delivery of Web services using the WebSphere MQ transport
- Support for SOAP toolkit users to provide assured delivery of Web services messages from a .NET environment
- MQSeries Workflow 3.3 SupportPac includes:



- Publish business processes as Web services
- Consume Web services as business process activity implementations
- Interaction with Microsoft environments leveraging, WebSphere MQ as the reliable transport.

■ IBM WebSphere Commerce 5.4

Web services for e-commerce

- Subsumes WebSphere Application Server V4 Web services support
- Adds inbound/outbound Web services security, SOAP mapping, request redirection through Commerce server

■ IBM Lotus Domino 6

Collaborative Web services

- Subsumes WebSphere Application Server Web services support
- Includes Web services collaboration, converting Domino beans and applications into Web services

IBM Lotus products containing APIs to enable developers to build Web services TODAY:

- IBM Lotus Notes and Domino 6
- IBM Lotus Workflow
- IBM Lotus Discovery Server
- IBM Lotus Web Conferencing (Sametime)
- IBM Lotus Instant Messaging (Sametime)
- IBM Lotus Team Workplace (QuickPlace)
- IBM Lotus Learning Virtual Classroom
- IBM Lotus Learning Management System
- IBM WebSphere Portal Extend, Experience - Collaboration Center (available Q2)

Developers can create more robust and full-featured applications owing to Lotus products' open standards support (XML, Java, HTTP) and rich application programming interfaces (APIs). The following Lotus products contain APIs to enable developers to build Web services.

IBM Lotus Notes 6 and Domino 6 provide valuable services such as email, calendar and scheduling, security, replication and database and expose these services through a number of APIs called Domino objects in standard languages such as Java and COM. By hosting a Web service on Domino or WebSphere, exposing it with a WSDL interface, then listing it with UDDI, traditional developer interactions for necessary application information can be minimized and development cycles shortened.

IBM Lotus Workflow works on top of Domino, providing the ability to develop, manage, and monitor enterprise-scale, human-interactive business processes. By adding SOAP interfaces and WSDL descriptions to existing and new workflows, developers can create Web services that allow external applications to use Domino Workflow-based applications over the Web. Lotus Workflow also supports IBM WebSphere.

IBM Lotus Discovery Server is a knowledge server enabling search and expertise location solutions designed to ensure that all of an organization's relevant and collective experiences are readily available to help individuals and teams solve everyday business problems. Developers can add SOAP/WSDL interfaces over the expertise database that the Knowledge Discovery Server builds, enabling that information to be served as a Web service via any Web services-enabled system.



■ **IBM DB2 Universal Database V8**

XML-based publishing, consumption, and interchange

- XML-based publishing, consumption, and interchange
- Wrap stored procedures as Web services

The XML Extender in Version 8 makes it easy to generate Web services to query and update data in arbitrary tables, columns, and rows. A tool delivered in WebSphere Studio Application Developer allows the developer to choose which data should be exposed, and generates the required code, thus no Java needs to be written to deliver data access services. Also, stored procedures can be built and exposed as Web services.

■ **IBM DB2 Information Integrator 8.1**

- Compose, transform, validate XML documents and data
- Access XML, Web, or content sources as well as relational

■ **IBM DB2 Information Integrator for Content 8.2**

XML support for portals

- Repositioning of IBM Enterprise Information Portal
- Adds XML support

■ **IBM Tivoli Configuration Manager**

Installation and configuration of Web services

■ **IBM Tivoli Access Manager**

Centralized policy management including Web services applications

Managing the Web Services infrastructure

As more companies use Web Services technologies to develop applications, the need for managing the infrastructure that supports these applications also increases. Anticipating this need, IBM intends to provide tools that enhance the manageability of Web Services applications. By providing products that manage installation and deployment, security, performance and availability and storage management, IBM anticipates playing a significant role in Web services infrastructure management. Customers can benefit from using Tivoli products to manage their Web services infrastructure in the following areas:

- *Development* - IBM anticipates creating tools to allow Web Services to be automatically management-enabled during development. This can save time and money during the development phase and can improve the time to value for getting a manageable application deployed.
- *Deployment* - IBM intends to provide functions to automatically deploy and install a distributed Web Services-based application. This can require a less-skilled staff to deploy a solution and can result in lower IT costs and improved time to value by deploying the application quickly.

Basically, the Tivoli portfolio aids in software and network management of the Web Services infrastructure through:

- Installation and configuration of Web Services applications and infrastructure using IBM Tivoli® Configuration Manager
- Interoperability between IBM Tivoli Access Manager and Web Application Server, with future plans to embed Tivoli Access Manager within WebSphere Application Server
- Tivoli Access Manager is leveraged for authentication and authorization for centralized policy management of J2EE™ and legacy resources and is being extended for Web Services



- Management of availability, performance and business impact of Web Services infrastructure (WebSphere Application Server, IBM DB2®, applications)
 - Dynamically discover through ARM, Version 4 instrumentation the transaction path for a user request
 - Manage the contribution of each step in the transaction path
 - Manage the contribution of Web Services infrastructure and applications to business processes
 - Manage the contribution of Web Services infrastructure and applications
 - WebSphere Studio Development tools to enable developers to instrument Web Services applications for management

The Tivoli product portfolio is all about solutions management, whereby you can manage a solution as a set of components and their relationships. A well-managed Web Services infrastructure can help customers achieve key goals of reducing time to value and increasing interoperability and integration. The promise of open, standards-based, re-usable services is a great opportunity for IBM customers. There are many Web services-related technologies, and the benefits of applying them to business problems are being realized today. Management of Web services and their infrastructure is the next critical step. IBM, through its Tivoli® management products, intends to contribute to the maturity of Web Services by providing critical technology to manage the infrastructure required to effectively use Web services. Managing the emerging family of Web services-based class of service-oriented applications and their associated infrastructure is anticipated to be a key focus of future.

- **IBM WebSphere SDK for Web Services 5.0** available from developerWorks at <http://ibm.com/developerworks/webservices>
Self-contained tools and deployment environment for basic Web services environments (free from developerWorks)

IBM WebSphere® Software Development Kit for Web Services Version 5.0 (WSDK 5.0) offers a comprehensive and integrated kit for creating, discovering, invoking, and testing enterprise class Web services on the embedded IBM WebSphere Application Server Express V5.0. WSDK 5.0 is designed to address the needs of experienced Java programmers who want to quickly learn how Web services can be creating using existing Java components and achieve seamless integration with disparate systems. WSDK 5.0 combines IBM's industry leading expertise in Web services with the power and functionality of the IBM WebSphere Application Server 5.0 to offer a low-risk, affordable entry to Web services. Future versions will implement new Web services features in support of profiles and scenarios defined by Web Services Interoperability Organization (WS-I.org).

Supporting the latest specifications for Web services including WS-Security, SOAP, WSDL, and UDDI, WSDK 5.0 can help you build and test Web services that can be optionally integrated with other legacy services using IBM WebSphere Studio Application Developer 5.0 and deployed on industry leading IBM WebSphere Application Server 5.0.

IBM WSDK 5.0 supports the following key capabilities and benefits:

- **Ready to go**
Provides the tools necessary to create and test Web services in a tightly integrated package including a simplified Web application server, tools, documentation, demos and sample applications
- **Easy to use**
Delivers an out-of-the-box solution with quick installation for building and testing Web



services, with simple integrated tools that speed the creation and testing of Web services, including hot deployment to the application server. WSDK provides comprehensive documentation, tutorials and online forum support.

■ **Migration-ready**

Migration is available to production version of IBM WebSphere Application Server V5.0 and IBM WebSphere Studio V5.0

The following components are included in the IBM WebSphere SDK for Web Services Version 5.0:

- An embedded version of IBM WebSphere Application Server - Express, V5.0, providing support for SOAP 1.1, WSDL 1.1, UDDI 2.0, JAX-RPC 1.0, EJB 2.0, Enterprise Web Services (JSR 109) 1.0, WSDL4J, UDDI4J, and WS-Security
- A private UDDI v2.0 registry
- An entry-level database providing a JDBC implementation
- IBM SDK for Java Technology, version 1.3.1
- Tools to publish JavaBeans and stateless session EJBs as Web services, create Web services from WSDL definitions, and publish and un-publish Web services to UDDI
- Samples showing how to publish JavaBeans and stateless session EJBs as Web services, create Web services from WSDL definitions, publish, un-publish and lookup Web services in UDDI, and create secure Web services using the WS-Security specification
- Comprehensive documentation including Web services concepts, developer tasks, and reference materials

The purpose of the IBM WebSphere SDK for Web Services is to provide developers with an integrated tool to learn about creating and testing Java-based Web services based on open standards. The functions of the IBM WebSphere SDK for Web Services are based on open specifications such as SOAP, WSDL, and UDDI, and the current release runs on both Linux (Red Hat 7.2 and SuSE 7.1) and Windows (Windows 2000 Professional with Service Pack 2 and Windows XP Professional) operating systems.

The IBM WebSphere SDK for Web Services is a free-of-charge IBM technology offering that enables development and testing of Java-based Web services, and is not licensed for running production applications or redistribution for commercial gain. For production deployment of Web services, IBM offers the IBM WebSphere Application Server and IBM WebSphere Studio products, which provide a complete enterprise platform and development environment for Web services and Java(TM) 2 Platform, Enterprise Edition (J2EE).

In this developer kit, IBM provides the basic software components needed to create a Java-based Web services environment. The package includes an embedded application server supporting industry standard Web services specifications, tools for developing and testing Web services, together with code samples illustrating how to implement key aspects of Web services. Extensive documentation is included to assist developers with the basic concepts of Web services. The Service Registry API allows Java applications to "publish" and "un-publish" service descriptions and "find" such services based on parameters such as service name, interface, and protocol.

The IBM WebSphere SDK for Web Services contains:

- An embedded version of IBM WebSphere Application Server - Express, V5.0, providing support for SOAP 1.1, WSDL 1.1, UDDI 2.0, JAX-RPC 1.0, EJB 2.0, Enterprise Web Services (JSR 109) 1.0, WSDL4J, UDDI4J, and WS-Security
- A private UDDI v2.0 registry



- An entry-level database providing a JDBC implementation
- IBM SDK for Java Technology, version 1.3.1
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- Samples showing how to publish JavaBeans and stateless session EJBs as Web services, create Web services from WSDL definitions, publish, unpublish and lookup Web services in UDDI, and create secure Web services using the WS-Security specification
- Comprehensive documentation including Web services concepts, developer tasks, and reference materials

The IBM WebSphere SDK for Web Services provides a preview of Web services capabilities in WebSphere products. The IBM Web Services Toolkit (WSTK) is intended to deliver early implementations of novel Web services technology from various IBM labs. IBM WebSphere Studio is a comprehensive development and deployment environment for building, testing, and deploying on demand e-business applications. Founded on open technologies and built on Eclipse, WebSphere Studio provides a flexible, portal-like integration of multi-language, multi-platform and multi-device application development tools that maximize developer productivity, increase ROI and improves overall time to value. The IBM WebSphere SDK for Web Services provides an integrated environment to create and test Web services from existing Java components

The IBM WebSphere SDK for Web Services provides an embedded WebSphere runtime environment for the development and testing of industry standard Web services applications. The emphasis is on enabling the developer to learn, to develop and to test. Samples and documentation are included to help the developer master the technologies. IBM WebSphere Application Server provides an application deployment platform on which Web services applications and other e-business applications can run, with an emphasis on integration with business systems and applications, the provision of application management, and enterprise qualities of service including security, scalability, and reliability.

IBM WebSphere Application Server is a fully supported product that you can download for free evaluation from <http://www7b.software.ibm.com/dl/swws/swwsgddb-p> and then decide to purchase.

IBM provides the IBM WebSphere SDK for Web Services on an "as is" basis. There is a newsgroup for user feedback that will be monitored by the development team. If you don't find the answers you're looking for here, we invite you to post your questions to this newsgroup: <news://news.software.ibm.com/ibm.software.developerworks.webservices.devkit>.

The download license for the IBM WebSphere SDK for Web Services does not permit redistribution. If you are interested in a redistribution license, please contact your IBM representative.

- **Web Services Toolkit (WSTK)** available on <http://www.alphaWorks.ibm.com>
Leading-edge Web services technologies

The Web Services Toolkit (WSTK) for dynamic e-business is a software development kit that includes demos and examples to help in designing and executing Web service applications that can automatically find one another and collaborate in business transactions without additional programming or human intervention. Simple examples of Web services are provided, as well as demonstrations of how some of the emerging technology standards, such as SOAP, UDDI, and



WSDL, work together. The WSTK is based on top of the stable development platform and runtime environment of the IBM WebSphere SDK for Web Services (WSDK) also available from developerWorks. The WSTK showcases emerging technology in Web services and utilizing it is a good way to get an understanding of the most recently announced Web services specifications. However, for a product-level development environment for Web services, IBM WebSphere Studio Application Developer is recommended. It allows creation, building, testing, publishing, and discovering of Web service-based applications that support UDDI, SOAP, WSDL, and XML.



WebSphere Partner Momentum

IBM offers several programs and services that can help you address the business challenges of today. Web services distill best integration practices of the past into a few technologies that can be widely and consistently implemented using modern Internet open standards.

To enable the ecosystem of business partners, customers, system integrators, developers, independent software vendors, and IT executives, we are announcing programs that enable a better understanding of how to implement best practices using Web services, the business value of these technologies, building the right skills, and making Web services solutions available that help address today's business challenges.

Speed Start Web Services

For technical developers and IT managers, we are initiating the **Speed Start Web Services** program, providing a wealth of learning tools and education to help you develop Web services today with the right tools and know-how. Our Web services zone on our developerWorks site offers a wealth of information and resources for developers to get started quickly and easily. Check out IBM's developerWorks/webservices site for the latest information and tools to get you started quickly and easily. The site now includes:

- Overview of Web Services
 - Tutorials, articles, FAQ's, White Papers, IBM Redpapers
- Obtain a copy of the free SDK:
 - Link to CD request form (medium registration)
- Help me install and use:
 - WebSphere Studio Application / Web Services SDK
 - WebSphere Application Server / DB2 / Lotus Domino Server
- Attend a no-charge workshop:
 - Link to Developer Day info & registration page
- What's on the free SDK?
 - Catalog of CD contents
- Other product downloads:
 - Link to complete list of dW downloads incl. WebSphere, DB2 & Lotus
- Questions or Feedback:
 - Issues/problems obtaining SDK / Overall feedback
 - Questions on installation & using content
- Speed Start Web Services Tech Forum:
 - Link to SSWs Forum
 - Includes questions about installation
- Submit a Web Service application

The Web services "Boot Camp" consists of 9-10 tutorials that provide a hands-on introduction to web services. Each lesson is a balance of Web Services overview and hands-on, step-by-step, labs. The tutorials focus upon solving particular issues, rather than simply giving an academic analysis of a new technology or specification. These 10 tutorials are written by IBM Learning Patterns and include:

- Lesson 1: Creating your first Web Service
- Lesson 2: RPC-style Web Services
- Lesson 3: Integrating Business Processes: Point-to-Point SOAP Messaging
- Lesson 4: Integrating Business Processes: Point-to-Point SOAP with Attachments
- Lesson 5: Integrating Business Processes: Multiple entities collaborating in a given transaction(SOAP document centric)



- Lesson 6: Securing Web Services
- Lesson 7: Describing Web Services: WSDL
- Lesson 8: Discovering Web Services: UDDI
- Lesson 9: Publishing your Services: UDDI (work in progress)
- Lesson 10: Bridging the .Net/J2EE divide: Web Services Interoperability (work in progress)

Web Services Developer Days will provide face-to-face education as part of the **Speed Start Web Services** Program many different cities over the next few months. Its focus will be to move developers along the skills curve from "consider" to "prefer" IBM, by building their web services skills and enticing them to develop web services applications using IBM tools. Also, counter promote IBM's Web services products; and beat our other competitors on web services front.

Through the **Speed Start Web Services Program**, available on developerWorks, developers can tap into both online and onsite education for all Web services skill levels. Develop Web services NOW with the right tools and knowledge.

- Learn: Take advantage of online education & tutorials, webcasts and free seminars, articles, white papers and mentored forum support.
- Develop: With developer tools, trial code and sample applications, developers can quickly build Web services.
- Deploy: Get your Web services into production quickly by deploying and testing.

Web services Advanced Training for Business Partners

From a Services perspective, IBM also has a powerful new set of educational and mentoring services for our business partners which enables partners to capitalize on and maximize opportunities to increase revenue and fulfill business integration requirements with clients. This includes a comprehensive set of educational materials designed to raise attendee skill levels to "4" for Web services technologies and best practices. Along with these materials are tools, questionnaires, and design templates to help you understand your client's existing business challenges and enterprise architectures towards the goal of determining how Web services should be and can be used for mutual competitive advantages. Check out <http://ibm.com/webservices> for more information on enablement roadmaps and educational materials to help you achieve higher skill levels for Web services.

This mentoring program can help you identify new business opportunities, increase your customer base for increased revenue, lower your marketing costs, and leverage best practices and industry expertise. It can help you develop skills to take advantage of new technologies and to use new tools to rapidly integrate software internally and externally with reliable technical support. Increase your revenue through expanded and new business opportunities using Web services! IBM provides the broadest and fastest growing platform for Web services and cross-platform support with a commitment to open standards and a proven product portfolio with global reach and leadership.

To help our valued Web services on WebSphere (WoW) business partners build deep skills on the latest and greatest Web Services technologies, tools and platforms, the IBM Software Services for WebSphere has developed the **Web Services Advanced Training Program for Business Partners**. Offered to Web services on WebSphere (WoW) partners:

- The same advanced, cutting edge Web Services training IBM provides to top IBM Software Group Consultants. Developed and delivered by IBM Software Group Consultants who lead the industry in emerging WebSphere technologies.
- Four 4.5 Day Intensive Training sessions to choose from in 2003: Comprehensive set of Web Services labs and lectures designed to prepare attendees develop, integrate and deliver Web Services technologies and Best Practices with enterprise environments.



Web Services Executive Connection

For IT managers and IT executives, get the information you need now to achieve results fast with Web services while addressing today's business integration needs. Now available online are tools for you to evaluate current operating environments to assess your integration requirements and ability to attain a powerful On Demand computing model. While the Speed Start Web Services program is focused primarily on IT managers and developers, this Executive Path to Web services provides materials benefiting and focusing on the IT/Business executive. The Web site (ibm.com/webservices) provides links and resources for accessing valuable industry expertise and executive series seminars. It also includes a wealth of information on case studies and success studies reflecting real-life customer scenarios and how they've successfully implemented Web services to reduce costs and accelerate business integration. The libraries contain information on best practices for Web services along with a set of Readiness Assessment tools that can help you determine the right business models and the best approaches for addressing today's business needs.

The **Web services Executive Connection** enables IT managers and IT executives to get the information they need now to achieve results fast with Web services while addressing today's business integration needs.

- Evaluate your IT architecture by using IBM Web services Readiness Assessment or see how others have done it by reading through 50 + Success stories and case studies.
- Educate yourself on the Business Value of Web Services through our information kit. Take advantage of online and offline events to learn more and tap into our wide resource of articles, whitepapers, and webcasts from industry leading experts
- Execute through pilot projects for Web services. Learn how to get started today!

IBM Web Services Industry Councils

Newly-formed starting today, the Web Services Industry Council is anchored by industry leaders in order to promote and grow the adoption of Web services across industries while addressing key business challenges. The hope is to foster collaboration and thought leadership in order to implement Web services generating real business value. The councils will address specific industry barriers to Web services adoption, starting with several key industries:

- Manufacturing
- Financial and Banking
- Retail
- Insurance
- Government
- Others

The councils will leverage the industry expertise and technical competencies to generate cross-industry, business process driven solution roadmaps and best practices. Today, each major industry defines and leverages their own specific set of XML schema and Web services-related technologies. The challenge is to utilize these foundations and generate Web services applications that benefit each industry which both address industry-specific business challenges and can be reused by the major players within those industries.

The worldwide Web services Industry Councils enables customers and business partners to capitalize on and maximize their opportunities to increase revenue and fulfill business integration requirements.

- Reduce time to business value for Web services
- Address industry-specific hurdles to adoption and implementation
- Deliver best practices, education, proof of concepts, and implementation roadmaps
- Accomplish work via face-to-face and virtual means facilitated by IBM



- Leverage the expertise of industry leaders – IBM experts, customers, and business



Summary

To summarize, we see lots of synergy with Web services and On Demand. With IBM's proven product portfolio implementing advanced Web services today, we can help address key next-generation integration requirements for building, deploying, and managing Web applications in today's heterogeneous world. IBM is also offering a vast array of resources, information, education, tools, and applications that will help you realize increased revenue while maximizing your opportunities to be successful in ever-changing market spaces.

Web services are fundamental to IBM's e-business on demand strategy, based on real products providing real value to partners and developers. IBM is providing the most comprehensive Web services platform for integration today. IBM's unsurpassed commitment to open standards delivers on the promise of Web services interoperability (prevents vendor lock in and leverages existing investments). Evolutionary (vs. rip-and-replace) approach to Web services while reducing risks for customers with proven products at the enterprise level. Most trusted supplier of secure infrastructure (capabilities to enable secure Web services available today). IBM delivers a next generation application server and development environment for on demand e-business applications with the broadest Web services platform in the industry that simplifies application integration and accelerates application development. Committed and trusted web services leader with dedication to customers and partners.

Finally, we can summarize what is new and what your next steps can be to gain the know-how and the resources to be successful with Web services. The combination of IBM's proven portfolio backed by a wealth of services and support for developers, IT executives, and business partners like you offers the best way to leverage existing investments, build on existing skills, and maximize business opportunities. There is a wealth of information on everything touched on in this paper available on the IBM Web site for Web services at <http://ibm.com/webservices> . Check out any of these Web pages for more information on how to get started with Web services for On Demand computing *today!*