

Life at the
Edge: IBM's
WebSphere
Business
Connection
Lowers B2B
Process Barriers

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Life at the Edge: IBM's WebSphere Business Connection Lowers B2B Process Barriers

For more than two decades, the proliferation of computing and communications technologies has brought innumerable benefits to companies, large and small. But the same proliferation of software, hardware and protocols also has caused major headaches and cost overruns for IT managers. These managers have spent untold millions of dollars and thousands of hours developing bridges to link diverse systems and applications that otherwise couldn't communicate. By some estimates, integration projects consume as much as 40 percent of the average IT budget. In a perfect world, those funds would be devoted to advancing primary business goals, not wasted on handcrafting integration plumbing.

Interoperability problems were bad enough when confined to computers and applications behind each company's firewall. The challenges became even more daunting as companies started to build external links between their own systems and those of suppliers, partners and customers. After all, although internal enterprise-application integration (EAI) solutions were costly and time consuming, the value they delivered was sometimes great enough that companies could justify them, so long as the number of point-to-point connections was limited. By contrast, custom-built EAI-type links simply couldn't address the exponential complexity of "public processes" that needed to span multiple companies' systems and data-exchange protocols.

Over the years, industry vendors and their corporate customers created a variety of standard protocols to tackle the company-to-company computing conundrum. Electronic Data Interchange (EDI) protocols were one of the earliest and most notable efforts to automate the exchange of purchase orders, invoices, billing statements and other business data. Despite having nearly 20 years to establish itself, however, EDI remains relatively complex and costly—leaving most smaller firms out of the EDI loop. More recently, other data-exchange protocols have emerged, including ebXML (for conducting business exchanges over an XML infrastructure) and RosettaNet (a set of communications protocols tuned to the specific needs of trading partners in the electronics industry).

Although these and other standards efforts have paid some interoperability dividends, none has provided the combination of simplicity, cost effectiveness and universal industry support needed to establish a pervasive infrastructure for intersystem exchanges. A relative newcomer to the standards scene, however—XML-based Web services—may ultimately satisfy this Holy Grail quest. Virtually every systems and software vendor has pledged to back the three initial Web-services specifications: Simple Object Access Protocol (SOAP), Web Services Description Language (WSDL) and Universal Description, Discovery and Integration (UDDI). Indeed, most major application-server platforms and development-tools suites already support these standards, and enterprise application vendors are rapidly following suit.

Many observers, Summit Strategies included, expect Web services to facilitate intersystem data exchanges both in the realm of internal EAI connections as well as in the world of external business-to-business (B2B) communications. Web services won't be able to achieve this objective overnight, however. Nor will they do so without the availability of packaged solutions that can be easily and cost-effectively deployed, both by large enterprises and service providers as well as by their smaller trading partners and customers.

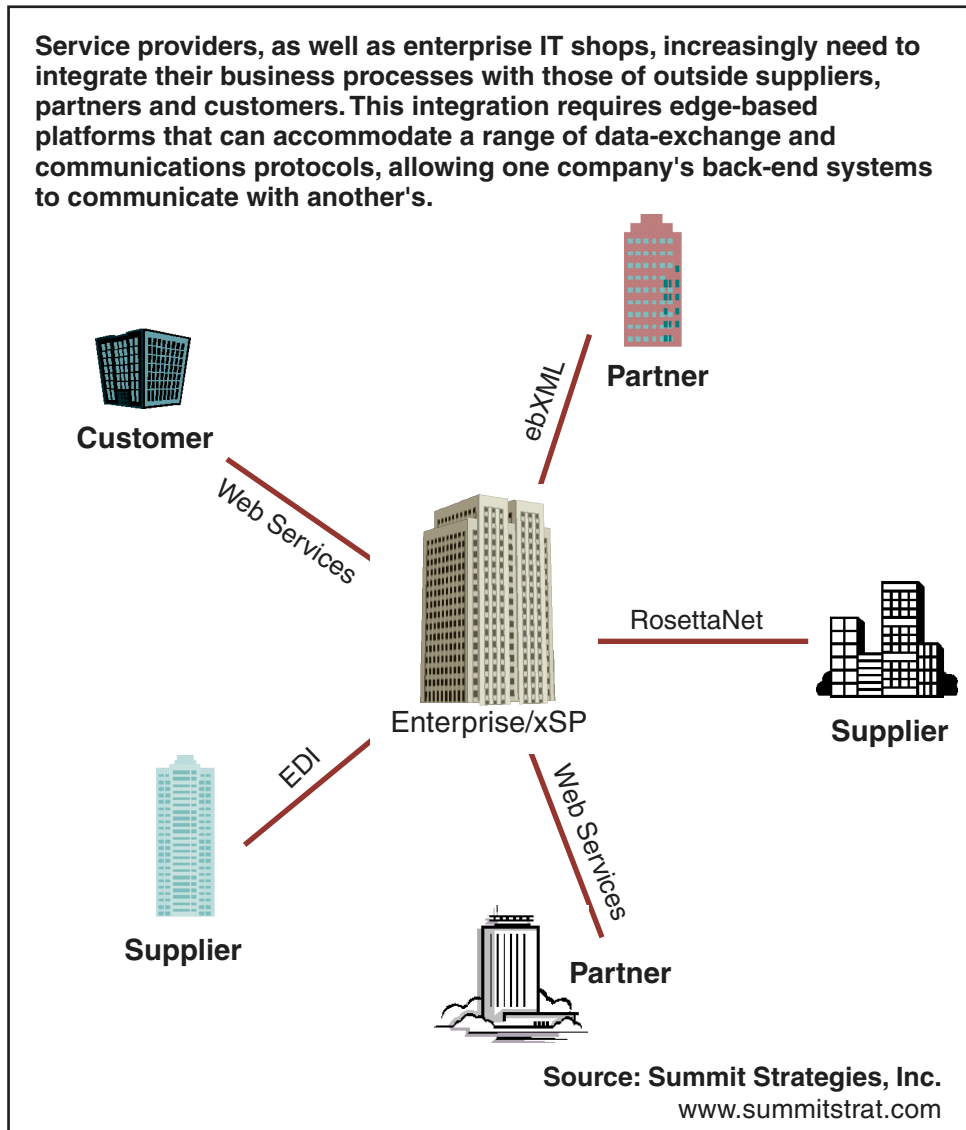
IBM, which has played a leadership role in developing core Web-services specifications, has spent the past year crafting a family of packaged solutions to address this problem. The products in this family, combined with IBM's middleware, use Web services as well as more traditional industry protocols to address the inter-enterprise integration challenge. In this paper, we explore how IBM's family of solutions—WebSphere Business Connection—has evolved, and describe the functions that its constituent products provide. We also profile two early adopters of the IBM offerings, and assess the competitive landscape in which the products play. We conclude with our thoughts about the prospects for WebSphere Business Connection, and about IBM's central role in delivering on the promise that Web services hold for B2B collaboration.

Section 1 Making External Business Processes Practical

WebSphere Business Connection products sprung from efforts IBM launched more than a year ago to solve the integration needs of electronic exchanges and other types of service providers (xSPs). Many of these vendors were stumbling over the hurdle of connecting their hosted systems with those of their customers. Each xSP, in essence, needed to function as a central hub that offered services to hundreds or thousands of companies arrayed like spokes around it (see Figure 1). As it turns out, enterprise customers looking to establish B2B links with their supply chains, business partners and customers share many of the same requirements.

Figure 1

Supporting Company-to-Company Business Processes



As one example of the need, e-exchanges require simple “on-ramps” that member companies can use to access the trading networks. The larger exchanges sometimes try to impose proprietary data-exchange protocols on their members, but small companies often lack the resources and the skills needed to support those protocols. At the same time, exchanges and other xSPs can’t afford to build point-to-point links to each candidate customer and its unique collection of systems and software. Without a solution to this problem, xSPs have struggled to attract the critical mass of customers necessary to achieve profitability.

As an early proponent of the xSP computing model and an infrastructure provider to xSP customers, IBM had a vested interest in helping these

companies succeed. To this end, IBM assigned a team within its emerging business unit to research the integration needs of the xSP community and devise solutions for it. The IBM team quickly realized, however, that it wasn't just xSPs that needed a better way to execute and manage external business processes among multiple trading partners; as we have noted, enterprise customers increasingly shared this requirement. Given this common need, IBM expanded its universe of candidate customers to include enterprises and their trading partners, along with the initial target of xSPs.

IBM didn't lack for tools and technologies to apply to this task. Foremost among its relevant products was the WebSphere portfolio of tools and middleware components. With the Java 2 Enterprise Edition (J2EE)-based WebSphere Application Server at its core, this diverse product family includes a full spectrum of elements—from portal server to content management to Website monitoring and management to a development-tools suite—specifically designed to provide a foundation on which to build and deploy dynamic e-business solutions. The WebSphere family also delivers a range of connectivity options, including support for J2EE Connector Architecture (JCA) and for the SOAP, WSDL and UDDI Web-services specifications, among other options. Furthermore, IBM's MQSeries has long reigned as the industry's most broadly deployed messaging middleware platform.

IBM expanded its solutions set in January 2002, when it completed its acquisition of CrossWorlds Software. The acquisition gave IBM several products designed to automate business processes across multiple applications. IBM had worked closely with CrossWorlds for years and, post-acquisition, immediately set out to integrate the CrossWorlds software more completely into the WebSphere line (full integration should be complete within the next year). Among the acquired products:

- *CrossWorlds InterChange Server (ICS)*, which provides a foundation platform on which to build business-process integration and management solutions;
- *CrossWorlds Collaborations*, which are pre-built integration modules that support common business processes in a variety of industries; and
- *CrossWorlds Connectors*, which are high-end adapters. There are Connectors for linking to specific applications, such as popular enterprise-resource-planning and customer-relationship-management products; for integrating with mainframe systems such as CICS, IMS and VSAM; and for interfacing to various technology environments, such as XML, MQSeries and the Java Message Service (JMS), among others.

Even this wide range of WebSphere and CrossWorlds products didn't fully solve the B2B interoperability problems facing xSPs and corporate IT groups, however. The WebSphere family was designed to span both internal and external environments, and has been an early supporter of the

emerging Web-services standards. But even WebSphere lacked a good packaged solution that could cost-effectively address the data communications and exchange needs that were emerging at the outer edges of individual companies' computing environments.

To ensure that it fully understood these edge-computing demands, IBM's emerging business team worked closely with a number of enterprise customers and xSPs—including several established exchange operators. In collaboration with these customers, the IBM team created a family of products designed to meet the real-world challenges companies were encountering as they attempted to set up business processes that crossed corporate firewalls and leveraged multiple companies' systems.

The new products, the WebSphere Business Connection family, provide a B2B integration extension to the broad-based "WebSphere Business Integration" initiative that IBM just launched in June of this year. As we explain in Section 2, the WebSphere Business Connection products provide connectivity for business partners by working in combination with WebSphere Business Integration, WebSphere Portal Server and other IBM technologies.

Section 2 The WebSphere Business Connection Family

In working with its enterprise and xSP development partners on the challenge of B2B processes, IBM soon determined that there was no one-size-fits-all solution to the problem. Business-process hubs could range from fairly simple environments with just a few users to extremely complex environments with spokes radiating to potentially thousands of customers and partners. Likewise on the spoke end of the connection—some companies needed little more than a browser connection to a portal or a simple standards-based gateway to one or more hub providers; others needed the ability to do more sophisticated edge processing to supplement the services delivered by the hubs. At the same time, IBM recognized that the 20-year standby, EDI, was still in use, and that many customers planned to move EDI to the Internet in order to avoid the costs of EDI over value-added network costs, while extending the life of this tried-and-true technology.

IBM has created a hierarchy of products within the WebSphere Business Connection family to address the spectrum of needs, from low-end to high (see Figure 2). These include:

1. WebSphere Business Connection Express;
2. WebSphere Business Connection; and
3. WebSphere Business Connection Enterprise.

Figure 2

WebSphere Business Connection Product Specifications

The entry-level Business Connection Express product provides a gateway that supports the Web-services standards of SOAP, WSDL and HTTP. The mid-tier and high-end Enterprise versions of the Business Connection family add support for additional protocols and functions, as well as license rights for greater numbers of Web-services connections.

Components and Connectivity	WebSphere Business Connection Packages	WebSphere Business Connection Express Edition	WebSphere Business Connection	WebSphere Business Connection Enterprise Edition
Included Products				
WebSphere Application Server 4.0.2 Advanced Edition—SS		X		
WebSphere Application Server 4.0.2 Advanced Edition—MP			X	X
WebSphere Business Connection Technology (includes Web Services Gateway)		X	X	X
IBM SecureWay Directory Version 3.2.2 for Windows NT		X	X	X
CrossWorlds InterChange Server 4.1.1—Runtime Use			X	X
CrossWorlds XML Datahandler			X	X
CrossWorlds Full Toolset—Operational Tools			X	X
CrossWorlds Trading Partner Interchange Solo			X	X
CrossWorlds Connector for JMS				X
WebSphere Data Interchange for Multiplatforms V3.1				X
Connectivity Licenses				
Partner Connections—Web Services		10	50	100
Partner Connections—TPI (EDI connection)		N/A	1	1
Back-End Applications/Technology Connections		N/A	1	1

Source: IBM

Although counterintuitive, it's possible that the most modest of these products—WebSphere Business Connection Express—will prove the most critical to the overall success of IBM's B2B-process portfolio. As we have noted, IBM already had a broad suite of products that could be configured to support many of the needs of hub operators, be they enterprises or xSPs. What was missing was a low-cost, entry-level solution that could

bring small “spoke” companies into these trading and business-process networks. With its Express product, IBM intends to democratize business-data interchange so that even small businesses can join the party.

WebSphere Business Connection Express consists of two main elements. The first is WebSphere Application Server, version 4, licensed for use as a platform for running B2B connectivity. The second element, which provides the B2B connectivity, is the Web Services Gateway, a runtime component that exposes WSDL-defined services to the external world and imports WSDL-defined services from outside providers. The Gateway can also transform service requests from one protocol to another—for instance, converting a SOAP over HTTP request to a SOAP over JMS request. In addition, the Express product supports large file transfers. Using this capability, businesses transmitting multi-megabyte documents won’t need to restart their transmissions from scratch, should glitches occur halfway through the process.

As indicated by its name, the Web Services Gateway is designed to support only the core SOAP, WSDL and UDDI specifications. To use the gateway, a company’s back-end systems either need to directly expose their processes as WSDL-described services, or to convert its processes to Web-services protocols before they reach the Web Services Gateway. To facilitate this, IBM notes that the underlying WebSphere Application Server provides a wide range of JCA adapters for linking to popular back-end applications. The WebSphere Application Server itself can then convert JCA-based transmissions into the Web-services protocols required by the Gateway runtime.

In operation, WebSphere Business Connection Express not only provides Web-services-based connectivity, but also can be used to automate some business processes that would otherwise require manual processing. For instance, a company using only a Web browser to link to a hub provider would need to submit individual purchase orders by hand. Using the Express platform, the company can write J2EE-based business processes that, in this case, can automate the submission of hundreds of purchase orders. WebSphere Business Connection Express-based business processes can also support functions such as applying simple rules to flag orders that require supervisory approval prior to transmission. This low end of the Business Connection family, however, isn’t designed to support the higher-level CrossWorlds Collaborations that some sites will want to execute.

To leverage some of the CrossWorlds technology, and to move beyond the realm of pure Web services and J2EE exchanges, companies can graduate to the mid-tier WebSphere Business Connection platform. In addition to the WebSphere Application Server and the Web Services Gateway, this mid-level product includes the CrossWorlds ICS runtime. The ICS platform gives this Business Connection edition the ability to run CrossWorlds Collaborations. This member of the Business Connection family also provides a version of the Trading Partner Interchange (TPI Solo) product, which

supports a range of security standards and allows companies to exchange data using other popular protocols, including ebXML, RosettaNet, S/MIME and the EDI protocols of AS1 (EDI over the Internet using SMTP) and AS2 (EDI over the Internet using HTTP).

In addition to supporting several data-exchange protocols and transports, the mid-tier Business Connection also introduces a newly developed technology called the Federated Partner Profile. In essence, the Federated Partner Profile consolidates information about the different protocols and gateways that each company is using to exchange information with various partners and customers. The profile “federates” information from the various gateways beneath a single interface that a company’s systems can access when communicating data and services. The Federated Partner Profile notes the destination of the transmission and ensures that each company receives the protocol that it requires.

At the top of the product hierarchy, the WebSphere Business Connection Enterprise delivers all of the functions of its lower-end siblings plus the added value of EDI over the Internet. The Enterprise version includes IBM’s WebSphere Data Interchange for Multiplatforms, a recently announced product initially available only for mainframe customers. By combining Data Interchange with Business Connection, IBM provides a relatively affordable EDI-over-the-Internet capability. Among other functions, this product converts data either to or from EDI standards or other data formats, and also provides various transaction-management capabilities.

For those xSPs and enterprises that require top-of-the-line functionality and scalability, IBM provides a reference-implementation architecture for a full Business Integration B2B hub. This high-end platform includes the Business Connection Express function (with additional partner connections), the newly released WebSphere Business Integration platform (which bundles CrossWorlds ICS and the CrossWorlds Toolset with the WebSphere MQ Integrator and MQ Workflow products) and WebSphere Portal. In addition, the hub includes a full-function TPI product for 10 or 100 connections (TPI On-Ramp or TPI Trading Network), Tivoli Access Manager for e-Business and IBM’s LDAP server.

The WebSphere Business Connection family, in combination with the Business Integration hub, provides much of the core functionality that xSPs and companies need to initiate B2B business-process exchanges. IBM stresses, however, that it intends to expand its current product set with additional products and features, including:

- Additional process templates that provide out-of-the-box support for core business processes common in key vertical markets;
- Monitoring and management tools to help hubs, as well as spoke companies, better track the status of B2B processes and to initiate corrective actions if problems occur; and

- Support for new, higher levels of Web services that are currently working their way through various standards bodies. IBM is intimately involved in driving the creation of Web services for security, quality of service, remote portlets and other functional areas.

Section 3 **Business Connection in the Real World**

IBM is hardly alone in identifying the growing demand to support B2B business processes. Virtually every major platform vendor, as well as most technology integration vendors, is pursuing the same objective, and many have impressive products and credentials of their own. Among the platform vendors, Microsoft is as vested as IBM in driving the success of Web services, and has a long history of building commodity solutions for the business masses. Other platform competitors, including Sun Microsystems and BEA Systems, have also signaled their intent to facilitate company-to-company business processes. Focused integration vendors—such as webMethods, TIBCO Software, Vitria Technology and Peregrine Systems—also plan to jump into the fray. Each of these companies brings specific strengths to bear on the challenges associated with B2B integration; and the growing market demand for such solutions will almost certainly support a range of integration competitors and products.

That said, it's difficult to identify any single competitor that can match IBM's product-line breadth, its professional-services expertise and its ingrained position as the dominant provider of enterprise-grade infrastructure. Furthermore, we know of no other vendor that has created a packaged solution set similar to the WebSphere Business Connection family. As we have noted, the IBM products aim to automate not just the edge computing of xSP and enterprise hubs, but also to provide a cost-effective entry point for smaller companies wanting to achieve B2B interoperability.

Two IBM partners—Nekema and E2open—worked closely with IBM during the definition of the Business Connection products. Although both are service providers, the benefits they expect to gain from deploying WebSphere Business Connection could be realized by enterprise customers, as well as by other xSPs.

Nekema

Nekema offers a hosted B2B service to help insurance carriers and the agents and brokers that sell the carriers' products to interact more efficiently. Traditionally, insurance customers go to agents, who fill out application forms on their systems; send the forms to carriers that might be able to compete for the customers' business; and write any policies that get sold. This bidirectional carrier-to-agent channel is notoriously inefficient, according to Nekema CEO John Rhodes. His company sells a service to automate data exchange between agents and carriers, and to streamline this process. On the front end, agents enter an insurance applicant's infor-

mation into Nekema's system. Then, Nekema processes and evaluates that information, based on rules that reflect the risk-selection and underwriting criteria of the different carriers in Nekema's network. By automating this evaluation, the Nekema system can flag and eliminate applications that don't meet any carriers' criteria, and can direct the remaining applications only to carriers able to respond with specific policy offers. Nekema's network currently includes three property-casualty carriers; 1,500 agencies; and approximately 11,000 professional agents.

Each agency has its own internal systems and workflow processes, as do the insurance carriers. In fact, the carriers typically have anywhere from 50 to 100 distinct systems in-house, ranging from various policy systems to different claims, actuarial and payment systems. The consequent complexity of business processes and information flow is the direct source of the inefficiencies present in the insurance channel—inefficiencies that total as much as 10 percent of the total industry's revenues, according to one estimate. To integrate its hosted services with its customers' back-end systems, Nekema may have to do a significant amount of custom coding. Even with that task behind it, Nekema must retool its connections if a carrier changes one of its back-end systems or workflows. The requirement to custom-build connections has obvious expense ramifications in expanding the universe of carriers in Nekema's network, and does not help the objective of removing frictional costs from the channel.

Nekema, which contracted with IBM to help develop its insurance services and to host on a WebSphere infrastructure, also worked with IBM on elements of the Business Connection initiative, which will expedite and simplify its services. CEO Rhodes believes that the insurance industry can benefit greatly through the deployment of such standards-based edge-computing platforms. "We need pervasive middleware that allows a free flow of information, versus constantly having to build one-off implementations and having to change them whenever a carrier made a change," he says. WebSphere Business Connection holds the potential to deliver that pervasive middleware, Rhodes says, which will be good for both Nekema's carrier and agent customers, as well as for Nekema itself. "The easier it is for me to connect, the more ways my customers and I have of generating money," Rhodes explains. "If Business Connection succeeds in encouraging the use of open standards, it will make my life just that much easier."

E2open

E2open was formed in mid-2000, the result of a collaborative effort among 10 of the world's largest electronics companies, IBM included. E2open's charter is to help its founders and other industry participants integrate and collaborate more effectively with business partners. The company provides a network hub-and-spoke solution that uses a shared network infrastructure. The open, standards-based and dynamic network enables multi-company processes across business partners, supporting advanced connectivity, any-to-any translation, and a Web-services-based architecture

for scalability. E2open aims to help OEMs and their business partners avoid high infrastructure costs, lengthy quality-assurance cycles, and ongoing support costs by outsourcing their B2B communications to the network. One of the most valuable services E2open provides to its member companies is any-to-any protocol translation—moving, for instance, from RosettaNet to EDI and back again.

“Our fundamental belief is that there will continue to be many protocols,” says Lorenzo Martinelli, vice president of marketing and strategy at E2open. Even so, he says, Web services are emerging as the interoperability standards of choice for many of its member companies. “A year from now, some people may bypass RosettaNet and just publish applications as Web services,” Martinelli predicts.

The fundamental equation for E2open’s success is to make it simple for smaller companies to connect to the big electronics suppliers. “EDI took 15 years to get a 10-20 percent adoption,” Martinelli notes, because of the cost and complexity of participating in EDI networks. The Web Services Gateway provides a mechanism to address the needs of smaller participants, he believes. Just as Web browsers quickly got millions of people connected to the Internet, Martinelli says, the Web Services Gateway could encourage thousands of companies to establish B2B-process relationships over the Web. Product offerings such as WebSphere Business Connect Express for E2open—a collaborative effort between E2open and IBM that provides a one-click installation process to bring new partners into the E2open network rapidly—should facilitate even faster adoption.

E2open has offered custom integration services to help companies link to its services. But, these integration services are more of a necessary evil than a source of revenues for E2open, Martinelli says. To achieve a critical mass of electronics-industry participants, E2open needs to grow from its current membership of about 650 companies to 2,000-3,000 electronics suppliers, Martinelli estimates. He expects the WebSphere Business Connection family—and, particularly, the low-cost Express platform—to be a critical factor in helping E2open achieve those membership targets.

Section 4 Delivering on Web Services’ Promise

By virtually any measure, IBM’s WebSphere Business Connection product line appears well designed and well timed to address the market’s escalating demand for B2B interoperability solutions. The products place support for Web services at their core, but also accommodate—at the higher levels of the Business Connection family—other popular protocols, such as RosettaNet and the common EDI specifications. That said, IBM clearly has signaled its preference to see Web services become the *de facto* fabric over which most B2B interchanges occur. With its Web Services Gateway-equipped Business Connection Express product, IBM may own a vehicle capable of driving Web-services adoption rapidly across thousands of

smaller firms that might otherwise wait for years before adopting these emerging protocols.

True, IBM isn't necessarily the best-positioned vendor to market solutions to small companies. But the vendor can count on its enterprise customers, which own or influence hubs, to do much of the heavy lifting in this regard. It will be in the interest of these hub providers, be they xSPs or enterprises, to proselytize Business Connection Express to their trading partners and customers. The hub providers can lower their operational costs and increase their profitability by encouraging others to standardize on the IBM platforms. No one should expect any B2B business-process solution to provide seamless plug-and-play capability straight out of the box; but IBM's Business Connection platforms should significantly reduce the barriers faced when creating business processes that span companies.

Although IBM won't lack for competition in this market, the company's biggest challenge may reside closer to home. IBM may find that the breadth and complexity of its own product portfolio pose one of its biggest problems. IBM has culled through its diverse portfolio to find the best components to package within the Business Connection products, and has supplemented these components with newly developed products and technologies. But, the WebSphere family has grown so large and diverse that IBM risks muddying the positioning and marketing message for any of the individual family members. In this instance, the vendor will have to work hard to communicate the role that the WebSphere Business Connection products play within the similarly named, but broader, WebSphere Business Integration initiative. The Business Connection products themselves, of course, encompass an array of underlying WebSphere and CrossWorlds components.

Positioning challenges notwithstanding, we believe that IBM was wise to attack the problem of B2B business processes head on, and to create distinct product packages that bundle elements that customers would otherwise need to package themselves. In addition, IBM's predisposition towards encouraging the ultimate users of its products to help define the products' design and their feature sets bodes well for their success in the market.

IBM's enterprise-computing legacy, its long-standing involvement with the service-provider model—including its own hosting activities—and its position at the vanguard of Web-services development provide it with impressive credentials to address B2B integration demands. With its WebSphere Business Connection family, IBM appears to have put its talents and its technologies to good use. We expect that the edge-based Business Connection platforms will become widely deployed products that help catalyze the adoption of Web-services standards and the growth of cross-firewall business-process integration.

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