IBM

Building and running a dynamic e-business

WebSphere software platform advantages

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Introduction

e-businesses are not created equal. They are molded by the evolving needs of stakeholders—customers, suppliers, trading partners, sales channels and employees. These needs shape requirements and challenges for you as you create an online user experience and integrate information and transaction processing to successfully operate a business on the Web.

Because of expanding adoption of new technologies and marketing strategies, e-business now encompasses added modes of user interaction (portals and voice), innovative business models (e-marketplaces and auctions), access (wireless) and devices (personal digital assistants and cell phones). This white paper describes the dynamic requirements of e-business and discusses how two approaches to running a successful e-business compare—using IBM WebSphere® software platform and BEA WebLogic software platform. It discusses how using IBM WebSphere software solutions can help you take advantage of a wider, more complete array of e-business applications and business process integration tools than you could by using another brand.

Succeeding in dynamic e-business

To claim a successful dynamic e-business means you've established confidence that your operation is dependable. You've adopted new business flexibility that lets you change to meet marketplace shifts and move as your e-business grows. And, your customers come back again and again. It takes customer loyalty, business agility and reliability to win in e-business.

Customer loyalty needs to be cultivated to produce repeat business. Once is not enough. To maintain customer loyalty in a dynamic e-business environment, companies must provide an engaging and compelling experience for customers and users, and adapt their e-business capabilities fast, as marketplace practices and user access preferences change. What is a compelling user experience?

- *Personalization of content to individual end users*
- *User-controllable portals to organize multiple information sources and applications*
- *Diverse business models—business-to-business (B2B), business-to-consumer (B2C), e-marketplaces, auctions*
- *Multiple-step transactions supported across any device, such as Web browsers, mobile personal digital assistants (PDAs), cellular phones, Internet appliances, in-vehicle information systems, set-top boxes*
- *Global applicability, such as national language support and automated language translation*

Whatever your starting point, an e-business needs a compelling user experience and the agility — to support transactions, information-sharing and evolving business models — that comes only through integration across applications and business processes. Internally. And with trading partners. Elements that add to your business agility are:

- *Application integration within your business*
- *Business process management — modeling, integration and automation of the business processes that span the organization, including integration with customized packaged solutions, such as enterprise resource planning (ERP), customer relationship management (CRM) and supply chain management (SCM)*
- *B2B transaction integration — crossing diverse transaction formats, communication protocols and application standards*

Just as important as a compelling user experience and powerful business integration, delivering reliable predictable service to customers and transactions with suppliers can make or break your e-business. Reliable business operation comes from:

- *Thoroughly tested, quality software*
- *Scalability across multiple processors, servers and networks*
- *Skilled technical support*
- *Expert integration services*
- *Certified implementation partners*

A dynamic e-business is constantly changing. You can't mesh a compelling user experience with powerful business integration while delivering reliable, scalable service unless you have cost-effective tools. Tools to build your e-business quickly and modernize your enterprise infrastructure, and help you continually improve your revenue stream.

Running a better e-business

How do the WebSphere software platform and the BEA WebLogic software platform compare in meeting the requirements of customer loyalty, business agility and reliability needed to build and run an e-business? How capable are these platforms to deliver compelling user experiences, business integration and operational characteristics needed by the kinds of dynamic e-businesses that are emerging from leading companies today?

Create a compelling user experience

A WebSphere software solution can provide a superior user experience that includes wireless reach across a wide range of devices with global coverage. The following compares aspects of Web user experience in terms of personalization, portals, voice services, e-commerce, pervasive computing and global readiness, including national language support and automated language translation. Personalization is at the heart of building customer loyalty, and the WebSphere approach gives an e-business more control and flexibility in establishing personalized services. It helps you adapt them over time, in step with customer interests and marketing and merchandising insights. Examples of WebSphere personalization advantages are:

> *Development tools.* IBM WebSphere Personalization is closely integrated with IBM WebSphere Studio and IBM VisualAge® for Java — award-winning, high-productivity development tools. To employ personalization features of WebLogic Personalization Server, you may need to use third-party tools for page design and add proprietary WebLogic JavaServer Pages (JSP) tags, which can slow development.

> *Transcoding.* WebSphere Personalization can leverage the page and data customization features of WebSphere Transcoding Publisher and a wide range of mobile devices supported by IBM WebSphere EveryPlace™ Suite. With WebLogic, you may need program data conversions, and fewer standards may be available for design of small pages, including cHTML and i-Mode (described later in this white paper). Personalization of mobile experiences can require more development effort and increase time to market with this approach.

> *Closed-loop personalization.* The WebSphere software solution offers closed-loop personalization based on tight integration between the WebSphere Personalization server and WebSphere Site Analyzer tool. So, campaigns can be adjusted rapidly based on user behavior observed on your Web site. The BEA WebLogic Personalization Server appears to include the third-party Broadbase site analysis tool under a limited license and may entail additional work steps to adjust campaigns.

Portals enable users to individualize their online experiences and build customer loyalty through increased convenience and control. The IBM WebSphere Portal family is a comprehensive solution for creating portlets (which display individual information sources and applications) and portals (multiple portlets) that can be accessed in multiple ways. Web browsers. Wireless. PDAs. The BEA WebLogic Portal Server user online experience may be less satisfying.

Content. WebSphere Portal software enables you to immediately select content from Hoover Online and Screaming Media. WebLogic appears not to offer pre-arranged content syndication packages.

Search. WebSphere Portal family includes the Lotus® Domino® Extended search engine. No built-in search engine is apparent in WebLogic Portal Server.

Browser instance. With WebSphere Portal software, a developer can choose to return results in the same portlet or spawn a new window. For many types of portal applications, WebLogic software spawns a new instance of the Web browser to display results. This can be confusing to users and consume unnecessary resources.

Event notification. WebSphere Portal software enables a user action in one portlet, such as changing a global search parameter, to be reflected in a related portlet, adding application design flexibility and user convenience. WebLogic appears to provide no event notification from portlet to portlet.

Exchange support. WebSphere Portal software includes built-in portlets for Microsoft® Exchange (Mail, Contacts, Calendar, Journal, Notes); Lotus® iNotes™ (Mail, Contacts, Calendar, Notebook, To Do List); Lotus Notes® (Mail, View); Lotus QuickPlace™ and Lotus Sametime®, with no need to hard-code names or install connectivity software. BEA WebLogic Portal Server apparently has limited support for the Microsoft Exchange collaboration environment. You can check for mail and search for contacts, but results may spawn a separate browser window. User names may need to be hard-coded and a separate installation of the J-Integra Java-Com Bridge may be required.

Single sign-on. WebSphere Portal provides single sign-on capability across multiple portal applications, making WebSphere-based portals convenient and supportive of user expectations. WebLogic seems not to provide single sign-on capability across multiple portal applications.

cHTML. WebSphere Portal software supports HTML, and cHTML (compact HTML) for limited-screen devices, for a wide range of device support. Out-of-the-box WebLogic may support only HTML-based devices (derived from standard Web browsers).

WebLogic Server, Version 4, expected end-of-year 2001, may resolve some apparent deficiencies but could require customers to purchase and integrate functions from third parties:

- *Content syndication through Screaming Media*
- *Search from Autonomy*
- *Collaboration and communication from Compoze and Caput.com*
- *Single sign-on and authentication from Netegrity and Securant*

Voice server technology

IBM WebSphere voice server technology enables end users to listen rather than read e-mail, voicemail, personalized news, financial updates, text and beeper messages and more. It also enables end users to give vocal commands to control what they hear next and to tell applications what tasks to perform. Voice server has utility for highly mobile employees and disabled professionals, who need hands-free information access.

E-commerce

With multiple editions of IBM WebSphere Commerce software solutions, organizations just getting started can do so less expensively, with WebSphere Commerce Start Edition. But you can select the WebSphere Commerce Pro Edition or WebSphere Commerce Business Edition, if you need more features or more B2B capabilities. Developers can buy the WebSphere Commerce Studio Developer Edition to get a spectrum of tools for deep customization of online stores and marketplaces.

Using the BEA WebLogic Commerce Server approach:

- *Customers that need basic or intermediate capability may expect to pay more and customize extensively.*

- *Customers may miss functions like Order Management, Business Relationship Management, Dynamic Collaboration-functionality that is found in WebSphere Commerce Business Edition but apparently absent in WebLogic Commerce Server.*

- *If you want auction support, you probably won't find it in WebLogic Commerce Server. B2B and e-marketplace providers seem to need to select and integrate a third-party auction solution. At additional cost. Included in WebSphere Commerce software, you get an Auction wizard and support for Open Cry, Sealed Bid and Dutch auctions.*

- *You can expect fewer security protocols than in WebSphere Commerce solutions. For example, the apparent lack of Windows Active Directory Services support in the WebLogic offering can complicate development of secure e-commerce solutions on Windows-based servers. Without Secure Electronic Transaction® (SET®) protocol, protection to buyers against questionable merchants can be lower. (SET was developed by MasterCard and VISA in conjunction with IBM and other technology companies.)*

- *E-commerce solutions based on WebLogic Commerce Server apparently require construction of XML-based messages of sales transaction data for handling by payments processing firms or financial institutions to process payments. WebSphere Commerce software includes support for Electronic Commerce Modeling Language (ECML) to facilitate payment acceptance from buyers' ECML-compliant wallets, such as IBM Consumer Wallet and IBM Payment Manager, which provides rapid setup of card authorization and payment links with financial institutions.*

- *Customers who want a built-in, quick purchasing capability can be disappointed if they find none in WebLogic software. IBM WebSphere Commerce software includes Quick Order/Buy to help you add this feature to an e-commerce site without incremental development.*

- *You need to be aware that, while BEA WebLogic Application Server supports multiple platforms-though fewer than IBM WebSphere Application Server, WebLogic Commerce Server seems to run on only a subset. Important enterprise platforms like IBM @server zSeries™ (IBM OS/390®) and IBM @server iSeries™ (IBM AS/400®) may be missed.*

- *When you need a Store Archive Services feature, with WebLogic software, you could find your developers need to organize their own storage facilities and have a small range of samples to choose from. The WebSphere Commerce solution includes Store Archive Services. The archive provides a general capability for storing the templates and configuration settings for prebuilt, existing and in-plan stores. WebSphere Commerce solutions include a range of sample applications for marketing (advertising, catalog browsing, pricing and promotions, personalization and loyalty programs) and order management (shopping cart and order form, tax, order calculation, customer service, catalog information management and site asset management.)*

- *You may be uneasy with WebLogic Commerce Server relative newness to e-commerce compared to IBM WebSphere Commerce software experience. BEA acquired it as part of Theory Center in 1999 and appears to still need full integration with WebLogic Application Server.*

- *WebLogic Commerce Server appears not to provide the necessary native development tools to build e-commerce applications. BEA seems to rely on WebGain tools for development, and it claims integration capabilities with leading tools, such as VisualAge® for Java. Lack of native tool integration can add a layer of complexity when you want to integrate custom applications with WebLogic Commerce Server.*

- *The BEA solution seems to rely on third-party products for content management and analysis. Necessary elements within any commerce offering, a lack of native products can mean added integration, implementation, skills and training costs.*

Wireless reach and pervasive computing

The WebSphere software platform supports a wide range of end-user devices and interactions. Some advantages to the IBM approach include:

Mobile standards. While WebLogic supports Wireless Markup Language (WML) and Wireless Application Protocol (WAP), it does not seem to support the i-Mode and other regional standards. BEA, instead, may establish relationships with specific network providers (such as Nokia and DoKoMo), so customers must select these vendors and possibly reduce WebLogic value as a global solution. WebSphere EveryPlace Suite supports mobile computing with WML over WAP, the Japanese i-Mode standard, wireless Internet Protocol (IP), Mobitex, Datatac and more.

Time to market. Developers using WebLogic may need to create custom templates for each combination of page design and device type, and craft conversion routines to reformat and filter content. A requirement that substantially increases development cost and time to market on new services for WebLogic users. WebSphere Transcoding Publisher, included in WebSphere Everyplace Suite, can automatically adapt, reformat and filter content. Both text and graphic, depending on the user's wireless device.

Global readiness

IBM WebSphere software platform is a solution for global businesses. The IBM approach brings benefits in:

Languages. WebSphere Application Server supports Brazilian Portuguese, English, French, German, Italian, Japanese, Korean, Simplified Chinese, Spanish and Traditional Chinese. WebLogic Application Server comes in English and Japanese versions.

Automated translation. IBM Language Translation Server can translate from one human language to another in realtime, with quality approaching that of human translators in selected domains. Faster and with less expense than by using staff. Applications range from on-the-fly translation of Web site contents, advertisements and search results to rough translation of documents and articles which can then be polished by human translators. WebLogic customers that need a language translation server must find an alternative and can use IBM WebSphere Translation Server.

Internationalization. The internationalization service, a part of WebSphere Application Server, Enterprise Edition, allows Java 2 Platform, Enterprise Edition (J2EE) applications to be written that intelligently adjust presentation and business logic from end-to-end. This means, in different client locations and time zones, your Web site adapts to variations in currency, data and decimal formats, language and more.

Establish powerful business integration

An IBM WebSphere solution stands out among competitive offerings, such as BEA WebLogic Integration, Tuxedo and eLink, when comparing business process integration capabilities. With a WebSphere implementation, you're likely to find the adapter or connector you need today. Rather than wait for it from BEA or a BEA partner, or paying for a solution that may be more complex than you need. WebSphere business process integration is founded on the well-known IBM MQSeries® technologies for messaging, message brokering, workflow management and rules-based transaction automation.

With IBM MQSeries Adapter Offering, you can start by interconnecting a few different applications without purchasing the full package. Later, you can add more adapters and scale up to MQSeries Integrator as business needs change and routing requirements become more complex. With BEA, you may have to select one of their sizable offerings, WebLogic Integrator, Tuxedo and eLink, getting more than you need. Many reasons to rely on WebSphere business integration solutions include enterprise application integration, business process integration, B2B integration, availability and scalability of integration and Web services.

Enterprise application integration
Platform (operating system) integration is the foundation for all higher layers of integration:

- *Local and enterprise applications*
- *Business process management*
- *B2B transactions*

Application integration can be as simple as converting one message format to another, or may require a rules-based engine to filter, divide, combine and route messages depending on their content or external variables. A WebSphere solution has advantages at the platform level and also with third-party business solutions (such as SAP), databases, industry-specific data formats, XML, communications protocols and component-object standards. Some examples are:

IBM MQSeries, at the core of WebSphere integration products supports Microsoft Windows NT and Windows 2000, Sun Solaris, IBM AIX and HP-UX, along with more than 30 other platforms. The WebLogic Integration Server is available on only the four platforms.

MQSeries supports 26 platforms in addition to the 10 platforms BEA Tuxedo client, the original flagship product, is available on.

MQSeries Everyplace supports Microsoft Windows 2000, Windows 98, Windows 95, Windows Me, Windows Ce, IBM 4690, EPOC, Palm OS and Java Virtual Machine (JVM). On the server side, WebSphere Transcoding Publisher bridges to multiple formats, markup languages and devices. BEA Tuxedo client appears not to provide an integration client for mobile devices.

Customers can buy individual MQSeries client and server adapters from IBM for specific needs at reasonable prices. With BEA Tuxedo client, you can expect to buy a substantial integration solution, either WebLogic Integrator or the Tuxedo and Tuxedo/Q combination, at additional cost.

Business process integration
Business process integration adds the human element to application integration. It addresses message, document and transaction flows between people, and between people and applications locally and across the enterprise.

WebSphere Business Integrator is based on the reliable MQSeries family of products and MQSeries Integrator technology, with many customer references available. WebLogic business process management seems to be an amalgam of WebLogic Process Integrator and integration technology partnered from Web-Methods. No apparent installations exist. Business process integration projects are resource-intensive and impact a potentially large number of employees. The outcome is yet to be seen.

Business-to-business integration
B2B integration includes application and, often, business process integration, and entails managing business relationships reliably beyond the enterprise. This includes retailers, distributors, suppliers, contract manufacturers and service providers. It may be necessary to establish whole suites of transactions (orders, changes, cancellations, financial remittances, credits) and to work with different protocols, such as electronic data interchange (EDI). In this complex arena, IBM has advanced technology and years of experience to call on.

> *Integration options*. IBM customers today use a wide range of data format standards: Java Message Service (JMS), XML, Society for Worldwide Interbank Financial Transfers (SWIFT), CORBA, Microsoft COM, Structured Query Language (SQL), COBOL Records, C null-delimited and others. With WebSphere Partner Agreement Manager, IBM provides a variety of adapters for MQSeries, utilities, SAP, Oracle, BAAN, PeopleSoft and i2, as well as channel partner connectivity through Partner Agreement Manager software, XML, EDI and RosettaNet channels.

Partnerships. IBM works with IBM Business Partners, such as Peregrine/ Extricity, Neon, Crossworlds and others to provide prebuilt adapters for multiple object components, relational databases, legacy application environments and enterprise applications. BEA apparently relies on a relationship with WebMethods to yield additional integration adapters.

Integration resources. The IBM Global Services organization has approximately 150,000 services specialists located worldwide. With approximately 700 representatives, BEA offers custom integration consulting at any stage of development, and predefined services including architecture assessment and design, architecture validation (prototyping) and education.

Availability and scalability of integration

If you are considering a WebLogic integration solution, look carefully at scalability and reliability, especially when trusted applications are involved.

Scalability issues. WebLogic Integration is built on BEA WebLogic Application Server. Scalability issues (vertical, horizontal and network) and performance issues (noncaching of content pages and database prepared statements), described later, can impact the server, depending on load.

Configuration requirements. It seems the developer must configure BEA Tuxedo to assure delivery of messages. When left undone, messages can be lost if a server crashes.

Administration issues. Tuxedo is apparently limited to 80 servers per domain. For server farms greater than this limit, the administrator can become responsible for exporting and importing Tuxedo message and queue definitions between domains.

Buffer limits. Tuxedo appears to handle only messages that fit into the available buffer space on sending and receiving machines. This can be an inconvenience in B2B situations that involve Tuxedo servers outside the control of the administrator responsible for the sending servers.

Companies choose IBM Web services

Storebrand ASA is Norway's largest financial and insurance company. Storebrand uses IBM Web services to capture the payroll records of approximately 400,000 employees of 6,500 companies, replacing a manual recordkeeping process and cutting costs. The data drives calculation of individual coverages. This solution is expected to be a foundation for a range of new business services.

Visualize Inc. offers visualization software to render 2-d data as 3-d information. Visualize has listed its on-Web service in a UDDI directory and is using WSDL and SOAP to offer the service as an application service provider (a new business model) in addition to selling visualization software.

Visualize is working closely with IBM to publish details on its visualization applications according to the WSDL standard. Visualize chose IBM because of its technical expertise and ability to get a Web services implementation off the ground quickly.

Web services

Web services represent a new business model and a new technology. Web services are based on open standards that IBM helped create from inception:

- *eXtensible Markup Language (XML)*
- *Simple Object Access Protocol (SOAP)*
- *Universal Description, Discovery and Integration (UDDI) protocol*
- *Web Services Description Language (WSDL)*

A first public discussion of Web services standards by BEA took place at its eWorld user conference, held in March 2001, in an XML workshop and in a keynote presentation by Alfred Chuang, BEA founder, president and COO. Recently, IBM proposed Web Service Flow Language (WSFL) for industry adoption. If accepted, WSFL would be an open standard for building complex Web service interactions that meet specific goals. If you are interested in rapid business development made possible with Web services, look closely at contributions from IBM and the successes of IBM customers who exploit them.

Count on reliable, scalable business operations

Reliable, scalable business operations are critical for any e-business. Reliability assures that you will be there for your customers, and scalability assures that your business can grow in pace with success.

Reliability. IBM is well known to provide reliability you expect in hardware and software to build a robust business. IBM delivers reliability because it has experience in coordinating integrated development across products. And this leads to progressive refinement of its products. BEA, founded in 1995, has acquired all its leading products: Tuxedo (Novell), WebLogic Application Server (WebLogic), WebLogic Commerce Server and Enterprise JavaBeans technology-based components (The Theory Center). BEA customers may find themselves having to learn how to make disparate technologies work together.

Reliability is built into IBM WebSphere Application Server. Applications that run in one WebSphere environment can run in other environments because of highly common code base across editions. Upsizing from BEA Regular to cluster-enabled BEA Enterprise Edition appears to require

substantial reimplementation that may add development time and cost and detract from reliability after conversion. Support for fail-over and clustering is included in WebSphere Application Server, Advanced Edition and WebSphere Application Server Enterprise Edition. No such support seems included in the BEA product.

The standard Web server in WebSphere Application Server is the IBM HTTP Web server (based on Apache), but you can also use Netscape Enterprise Server, Microsoft IIS or the Lotus Domino Web server as a plug-in. WebSphere plug-ins can be dynamically installed without restart to help increase reliability. WebLogic comes with an internal, proprietary Web server. If you need features offered by a third-party Web server (such as Sun/Netscape iPlanet, Microsoft IIS or Apache), you may need to use plug-ins. All plug-ins appear to be manually installed and static, and require the Web server to be restarted to make changes.

Scalability
Scalability is critical. Internet use is still expanding rapidly. Running out of capacity can result in a poor-quality user experience and affect customer loyalty. Many factors contribute to WebSphere Application Server scalability, including IBM understanding of how to create operating systems and software that fully exploit multiple processors on a server. Equally important is that IBM technologies for flexible clustering, cloning and intelligent load balancing can help leverage multiple servers in a cluster or across a wide area network (WAN). If yours is a large organization contemplating using BEA WebLogic to enable thousands of customers to transact business over the Web, you may encounter limitations in vertical, horizontal and network-related scalability:

Vertical scalability. WebSphere Application Server performance grows nearly linearly from 1 to 24 processors, resulting in a progressively wider performance advantage as the number of processors increases. Based on laboratory analysis of WebLogic Application Server on a range of platforms, WebLogic fully utilizes CPU resources in small Symmetric Multiprocessor (SMP) environments (1 to 6 processors). WebLogic CPU utilization declines in larger SMP environments (more than 6 processors) and results in only modest performance increments for each added processor.

Horizontal scalability within a server cluster. Clustering of multiple servers should provide scalability and fail-over. WebSphere Application Server uses a database to maintain the session state information needed for a Web experience to persist even when individual requests are handled by different servers in the cluster. A WebSphere solution can support clusters of virtually unlimited size. Rather than a database, WebLogic appears to periodically multicast session state information from each server to all others in the cluster. The result is an effective limit of 10 servers because of the growing, intraserver network traffic and memory management demands. With WebLogic, horizontal scalability seems limited. If a server goes down, apparently any session data that hasn't already been multicast is lost, and the related Web experiences could fail in unexpected ways.

Scalability across a WAN. IBM WebSphere Edge Server offering provides advanced ways to balance loads across servers, whether they are closely located or across the world. This technology enables giant sporting event sites (such as the Olympic Games) that IBM supports to reliably serve the world's largest hit and user loads. BEA WebLogic, in its basic round-robin load balancing capability, appears to need a front-end proxy server (third-party plug-in or an additional WebLogic Server). WebLogic seems unable to provide load balancing across the wide area (separate clusters).

Scalability at the network edge. Significant proportions of any Web experience are constructed from static or dynamic content that can be used repeatedly, such as a Web site help page, or this hour's weather map. With WebSphere Edge Server, you can substantially reduce the load on application and Web servers by caching these stable page parts and sending them to the end user when requested, from the edge of the network. It intelligently identifies requests that should spur rebuilding of expired content or creation of personalized page parts and passes the requests back to the application server. If you need the capability in the BEA WebLogic offering, you may have to build it yourself, use the IBM WebSphere Edge Server or employ a third-party edge service.

Performance-caching servlet: JSP results and queries
Performance impact on a specific Web site depends on the site architecture and complexity and the pattern of user requests. Some factors that limit performance in real-world applications that involve servlets, complex JSP pages and database access can be:

Dynamic caching of servlet and JSP results. WebSphere Application Server includes a Dynacache feature in which the results of a servlet, JSP or JSP subpage are cached to fulfill later requests. This helps improve server throughput and reduce server workload. Rules whether to cache or refresh content can be based on time or changes to invocations or database content. The BEA WebLogic server does not seem to include equivalent caching of servlet or JSP results, which may increase workload relative to a WebSphere environment for a given request stream.

Caching of database-prepared statements. Database SQL queries must be compiled by the native database manager before making a search. If the same query runs repeatedly (which is true for many Web applications), the compilation processing can become a performance bottleneck. The data source manager built into WebSphere Application Server caches prepared statements (compiled SQL queries) produced by the database compiler, and uses these in place of raw SQL, bypassing compilation, for significant throughput and performance improvement. A comparable feature is apparently absent in BEA WebLogic Application Server, which may increase database-processing relative to WebSphere Application Server for a given request stream.

Cost-effectively maintain and support software and services
A major factor to reliability and scalability is access to technical support. BEA software service and support seem limited, in terms of availability and price.

- *IBM hardware and software maintenance staff is available 24x7 across the world. BEA software maintenance staff is available in selected countries.*
- *With BEA software, you may pay separate charges for support and maintenance at a significantly higher total cost than you may pay with IBM WebSphere software. BEA does not appear to offer a maintenance program. When a new version becomes available, you may get a discounted upgrade cost. The discount is apparently determined at the time of the upgrade, making it difficult to prepare business plans that accurately estimate upgrade costs.*

Challenges to building a dynamic e-business

Most organizations have already discovered that building a dynamic e-business isn't easy. Almost every e-business project is inherently complex. The typical challenges are to:

- *Conceive, define, construct, test and refine new business models.*
- *Enable all users to connect to and leverage your business processes, information and employees regardless of the devices and interaction methods they use.*
- *Match personalized customer experiences to the spectrum of applications and business process solutions running on heterogeneous environments in disparate locations.*
- *Automate transactions from customers, across your business and with suppliers.*
- *Modernize and simplify your existing infrastructure and applications.*

Primary issues raised in meeting these challenges when you build a dynamic e-business include shortening time to market for new and modified services, availability of skilled implementation resources and cost-effectiveness. A WebSphere solution provides significant advantages in each area.

Shortening time to market

Important ways to shorten time to market for new and enhanced e-business capabilities are:

Breadth of applications. You can shave months off launch times by using a software platform that can support many types of preintegrated applications. You should also be sure you can configure the applications to support your company's specific needs.

Compliance with open standards. Open standards provide hooks by which you can extend an application in the future, expand the pool of available solutions from multiple vendors and simplify integration. Applications that comply with published technology standards save time and money later on and allow you to focus on growth. Staying with published standards (rather than jumping into preliminary standards, subject to change) prevents costly rework after going live.

Productive development. Productive development tools help get your products to market faster and forge stronger business relationships by enabling you (or your development partners) to rapidly extend your e-business across applications, across the enterprise and from business to business.

Finding skilled implementation resources

Few companies can provide all the skills and human resources needed to swiftly build and expand a dynamic e-business. Two important considerations follow:

- *Does your vendor (or its trading partners) have the implementation resources and skills needed to tackle your projects?*
- *Is your vendor doing enough to expand the pool of skilled implementers, whether independent software vendors, contractors and consultants or your own staff, with the training and technical support needed to effectively use the newer applications and development environments?*

Being cost-effective

There is no reason to spend too much to get the results you need. Reasonable and controllable software, support, maintenance and development costs help the e-business contribute more to your revenue stream while ensuring reliability and future growth.

Measuring performance

How do IBM WebSphere and BEA WebLogic meet requirements of time to market, reasonable costs and availability of skilled development resources you need to build an e-business? You can measure this by how well they provide the range of applications, development productivity, open standards, developer community support and ROI — promoters of success in dynamic e-businesses.

Adding more applications

WebSphere software platform has a broad range of user experience applications and business integration tools. Examples are IBM WebSphere Voice Server, IBM Language Translation Server and the many platforms, adapters and connectors for application and business integration available from IBM. The breadth of WebSphere applications can shorten your company's time to market in launching new e-business services and capabilities. BEA appears to have fewer applications and adapters to choose from, and because many come from different companies, they may require more learning and specialization by staff and can be more difficult to integrate.

Portal development

Some advantages to developing portals with WebSphere Portal software are:

- *Development is fast with a WebSphere solution. With WebLogic, you may need to develop nearly all portlets without assistance.*
- *You can visit the IBM Portlet Catalog to select prebuilt portlets for customization to suit your specific requirements. Over 180 portlets are available. (See For more information for the Internet address.)*
- *You can select, reuse and extend WebSphere generic portlets to handle some of the most common types of content.*
- *IBM WebSphere Portal portlet definitions are held in a single Portlet Archive file (created with standard Java® Archive, or JAR, utilities), which is then deployed to all servers automatically by a centralized Portal Administration Tool. Portlet deployment with BEA WebLogic seems labor intensive. To create the same set of portlets on multiple servers, it appears that you need to copy the portlet definition forms and assemble them individually on each server. If you change a portlet, you may need to recopy and reassemble on each affected server.*
- *WebSphere Portal family of products comes equipped with multiple-device support, including user registration, portlet selection and device recognition. Absence of support for cHTML apparent in BEA WebLogic can mean that time-consuming custom coding is required to support compact devices.*
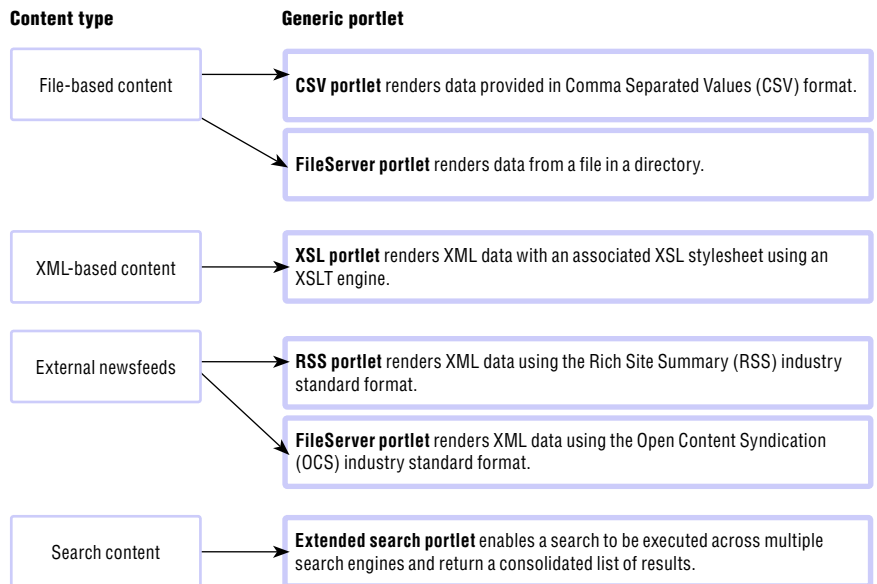
Content type	Generic portlet
File-based content	**CSV portlet** renders data provided in Comma Separated Values (CSV) format.
	FileServer portlet renders data from a file in a directory.
XML-based content	**XSL portlet** renders XML data with an associated XSL stylesheet using an XSLT engine.
External newsfeeds	**RSS portlet** renders XML data using the Rich Site Summary (RSS) industry standard format.
	FileServer portlet renders XML data using the Open Content Syndication (OCS) industry standard format.
Search content	**Extended search portlet** enables a search to be executed across multiple search engines and return a consolidated list of results.

Figure 1. WebSphere generic portlet

Transcoding to serve new touch points

IBM WebSphere Transcoding Publisher enables automated conversion of information from one standard to another, helping to reduce the time and cost of exploiting multiple standards.

- *JPEG images suitable for a Web site can be converted to wireless bitmaps (WBMP) appropriate for wireless devices or GIF files used in thumbnails, icons and fast-loading pages.*
- *HTML pages can be converted to WML format for PDAs and cell phones.*
- *XML content and XSL style content can be converted into a range of other content and style formats to suit the target application or device.*

Achieving the same results with BEA WebLogic seems to require that you obtain conversion utilities from third parties and integrate them as a custom-built Web-to-wireless or PDA infrastructure.

XML and XSL support

Robust IBM WebSphere Portal support for XML and XSL means that you can add XML-based content, Web pages and portlets to a Web site quickly and easily. The recently announced new generation of IBM WebSphere application development tools, based on open source Eclipse platform, provides a comprehensive set of XML creation, consumption, translation and storage tools. Included are an XML editor, document type definitions (DTD) editor, XML schema editor, XML-to-XML mapping editor, relational database-to-XML mapping editor, XML-from-SQL editor and others. BEA seems to ship only the Xerces parser and the Xalan translator, which were originally contributed by IBM to the XML standards community. With more limited tools, leveraging XML content requires extra time, resources and third-party tools. WebLogic Portal Server, Release 4.0, expected year-end 2001, may add XML-based portal definition through E-Business Control Center (WebLogic Personalization Server) used for campaign management.

Public standards and open platforms

IBM has spent far more than other technology and service vendors to foster open standards. The IBM objective is to follow a common set of public technology standards, and use them to create open, standards-compliant software platforms and applications. These standards include dozens of public Internet standards, J2EE standards, XML, Web services, business components standards and others. IBM developed, codeveloped and participated in the development of all these standards.

Developing for the BEA WebLogic Application Server

In the October 1, 2001 issue of eWeek, in an article titled "App Engines Revved," Timothy Dyck described the experience of developing applications for the WebLogic server:

"Although we could edit application deployment descriptors from Server Console, we couldn't create them from scratch. WebLogic provides command-line tools for this purpose, or developers can use a third-party development tool and then edit a generic deployment descriptor to add WebLogic 6.1-specific settings, which is what we did using Borland Software Corp.'s Jbuilder 5 Enterprise.

"This bare-metal feel extends to other parts of WebLogic because BEA relies on third parties, including Borland and WebGain Inc., to support development tools that work with WebLogic. Since these tools ship on their own release cycles, they always lag behind WebLogic itself, in the same way they do with the other application servers they support."

Now integrated throughout IBM operating systems and application software, these standards result in companies being able to create or expand e-business, or streamline their technology infrastructures by selecting standards-based software from a range of vendors with confidence that packages can work together. Packages that work together because they have already been tested. You can dramatically shorten your time to market with new e-business capabilities and stay ahead of competitors by selecting WebSphere-compliant applications.

A new release of IBM WebSphere Technology for Developers, announced December 2001, validates J2EE 1.3 compatibility on WebSphere Application Server. It enables Web transactions and interactions with a deployment environment for e-business applications. It provides a portable, Java technology-based Web application development platform to support and execute Java servlets, EJB, JSP and XML services while interacting with databases, dynamically changing content and other applications for dynamic Web content. It builds on the HTTP Server to provide the portability and high performance of some business applications, along with the flexibility of XML data services to offer a comprehensive XML-enhanced application platform based on Java technology.

Support for the developer community

A primary element of competitive success is to speed implementation by using expert developers when extending or enhancing an e-business. The IBM Global Services staff of committed professionals is a world leader in implementation. A specialized unit, Software Services for WebSphere, shares its architectural and technical skills across the WebSphere product family with customers to complement Global Services consultants' support. Together, these talents and expertise extend beyond the WebSphere software platform to include zSeries (OS/390), iSeries (AS/400), IBM @server xSeries™ (AIX), Linux®, Windows NT®, Windows® 2000, ERP, CRM and SCM. IBM solutions and business experience span industries from retail, financial services and distribution to communication, manufacturing and government. BEA may have an integration team of about 700.

IBM is a leader with certified implementation partners. Chances are your current system integrator already has WebSphere-certified consultants on staff. In addition to the more than 9,000 WebSphere Internet software providers (ISVs), IBM has development partnerships with dozens of companies in e-business and e-commerce technologies. BEA may have over 1,900 ISV and technology partners. Mid-2001, IBM WebSphere Developer Domain had 600,000 members, and displayed a growth track to exceed 1,000,000 active developers by end of the year. As of April 1, 2001, BEA claimed to have over 250,000 registered Java developers.

Improving ROI

An e-business must contribute to revenue stream. Normal return on investment (ROI) measures apply when selecting your technology platform. ROI should include:

- *Total cost of ownership (TCO) of the technology platform: acquisition, technical support, software maintenance and upgrades*
- *Comparative costs of development, system integration, deployment, systems management*
- *The impact of time-to-market delays resulting from platform differences*

Although every application has a unique combination of requirements, TCO can be lower if you select a WebSphere software platform. Some suggestions for evaluating the consequences of platform differences follow:

TCO comparisons

Comparisons between equivalent WebSphere and WebLogic Web server configurations show that TCO for WebSphere ranges from 10 to almost 40 percent, depending on the database used. Assumptions underlying these comparisons are:

- *Elements include all hardware, software and maintenance charges over a three-year ownership period (excluding application development, integration, deployment, systems management and time-to-market differences).*
- *WebSphere configurations include IBM DB2®; WebLogic configurations are shown based on DB2 and Oracle 9i. Customers may need to acquire a third-party solution as BEA apparently does not offer a production-level database. BEA seems to provide Oracle database drivers (jdrivers) for its newer versions of WebLogic Server V6.x, and configuration testing is generally limited to this platform. Most customers would opt for Oracle and pay its higher costs.*

- *Examples include two-tier (Web server and application server to database) and large SMP (12-way Sun) configurations. Similar results are found for other configurations, such as three-tier (Web server and presentation services to business logic to database), two-tier (Web server to application server and database) and small SMP (4-way Intel®).*
- *The comparisons assume no differences in performance between the WebSphere configuration and the WebLogic configuration. WebSphere has significant scale and performance advantages as loads (and corresponding server requirements) increase. You must examine your application profile and perform testing to determine the hardware and software configurations required, and to reflect these differences in your own TCO analysis.*

Other ROI factors

In addition to TCO, a comprehensive ROI analysis must consider costs for application development, integration, deployment and systems management, and the financial impact of time-to-market delays caused by platform issues. These factors vary widely by site architecture and complexity. Figure 2 shows how the productivity advantages of WebSphere application development tools and the comprehensiveness of the WebSphere software platform could expand the WebSphere edge beyond the TCO advantages described earlier.

Solution component	IBM acquisition cost	IBM maintenance/ support cost (3 years)	BEA acquisition cost	BEA maintenance/ support cost (3 years)
Web server	0	0	0	0
Application server	8,000 x 4 CPUs	3,000 x 4 CPUs x 3 years (support and maintenance)	10,000 x 4 CPUs	2,000 x 4 CPUs x 3 years (support) 2,000 x 4 CPUs x 3 years (maintenance)
Tier 1 Svr H/W	23,000	2,000 (IOR - 3 years)	23,000	2,000 (IOR - 3 years)
Database server	20,000 x 4 CPUs	5,000 x 4 CPUs x 3 years (support and maintenance)	20,000 x 4 CPUs	5,000 x 4 CPUs x 3 years (support and maintenance)
Tier 2 Svr H/W	23,000	2,000	23,000	2,000
SUB-TOTAL	158,000	88,000	166,000	112,000
Total with database	**IBM DB2 - 246,000**	**IBM DB2 - 278,000**		
IBM as percent of BEA	**89%**			
Total with database	**IBM DB2 - 246,000**	**Oracle 9i - 403,600**		
IBM as percent of BEA	**61%**			

Figure 2. TCO comparison for two-way configuration (in U.S. dollars)

Solution component	IBM acquisition cost	IBM maintenance/ support cost (3 years)	BEA acquisition cost	BEA maintenance/ support cost (3 years)
Web server	0	0	0	0
Application server	8,000 x 12 CPUs	2,000 x 12 CPUs x 3 years	10,000 x 12 CPUs	2,000 x 12 CPUs x 3 years (support) 2,000 x 12 CPUs x 3 years (maintenance)
Database server	20,000 x 12 CPUs	5,000 x 12 CPUs x 3 years (support and maintenance)	20,000 x 12 CPUs	5,000 x 12 CPUs x 3 years (support and maintenance)
Server hardware	~375,000	~25,000 (SOR - 3 years)	~375,000	~25,000 (SOR - 3 years)
SUB-TOTAL	711,000	277,000	735,000	349,000
Total with database	**IBM DB2 - 988,000**	**IBM DB2 - 1,084,000**		
IBM as percent of BEA	**91%**			
Total with database	**IBM DB2 - 988,000**	**Oracle 9i - 1,460,800**		
IBM as percent of BEA	**68%**			

Figure 3. TCO comparison for large SMP (12-way) configuration (in U.S. dollars)

ROI factor	Measurement approach
Application development • WebSphere development process is automated, reducing worksteps and staff time.	• Obtain quotes for like WebLogic and WebSphere projects from qualified firms. • Compare development work steps and time for representative units of work.
Integration • MQSeries adapters and connectors cover a wide range of needs, off-the-shelf. • WebSphere application and business process integration tools are productive.	• Compare availability of needed WebLogic and WebSphere adapters and connectors. • Compare integration work steps and time for representative connectivity needs.
Deployment • WebSphere deployment tools offer centralized configuration and control.	• Visit WebLogic and WebSphere users to observe deployment process, first-hand, and compare work steps and time.
Systems management • WebSphere systems management facilitates detailed data collection and analysis.	• List systems management requirements and compare WebLogic and WebSphere features at a detailed level.
Time-to-market • WebSphere platform has a wide range of e-business solutions. • WebSphere development is fast and productive	• Calculate e-business revenue for the difference in elapsed time for WebLogic and WebSphere technology-based projects. • Estimate loss of market position for longer elapsed time.

Figure 4. Measuring ROI

Figure 4 suggests ways to objectively measure important ROI factors that can result from the platform selection decision. If possible, conduct a test to compare development of a key part of your application, compare all relevant ROI factors and extrapolate from there.

Case studies

Many companies looking closely at competitive platforms have chosen WebSphere products because of their power and flexibility. British Airways is an example of an original BEA WebLogic user that now selects IBM solutions when expanding e-business capabilities and capacity. CareTouch also compared WebLogic and WebSphere and chose WebSphere Application Server. For more details on these and other case studies, visit the Internet address found in the For more information section of this white paper.

British Airways selected IBM WebSphere software platform for new functionality

The British Airways Web site was initially built by IBM Global Services in 1998, and the company chose WebLogic as the application server because WebSphere Application Server was not yet available. British Airways now relies on IBM software for new capabilities. In the following list, where BEA is not mentioned, it appears no product or service is offered in the category:

- *When British Airways needed to add scalability and load balancing to its high-volume site, it selected WebSphere Edge Server.*
- *The company needed Enterprise Application Integration function and selected IBM MQSeries software. It appears an equivalent BEA product is not offered.*
- *The British Airways solution also leverages a Lotus Domino technology-based publishing system.*
- *The company selected VisualAge for Java when it needed high productivity for developers.*
- *British Airways uses an IBM Transaction Processing Facility Operating System.*
- *To add new pervasive computing functions to its site, British Airways chose IBM software and services. The new capability developed by IBM for British Airways leverages WAP and enables customers to select seat locations on a graphical map on portable phone handsets. BEA appears to work with partner Nokia for these products and services.*

Caretouch chose IBM WebSphere software platform for scalability and robustness
CareTouch is a new service developed by Kaiser Permanente, the world's largest not-for-profit healthcare delivery organization. CareTouch foresees explosive growth for its CarePanion e-commerce system that supports 52 million people in the United States who provide life care. That is caring for sick loved ones with a continuing medical condition who are unable to live independent lives. With the help of IBM and the use of leading IBM WebSphere platform technologies, such as WebSphere Application Server, WebSphere Commerce family of products and VisualAge for Java, the Web site was built in 85 days. After a spirited vendor competition including Sun Microsystems solution featuring WebLogic softweare, the CareTouch executive team chose IBM and its WebSphere platform. Scalability and robustness were the deciding factors. According to Peter Juhn, M.D., president and CEO, "We are planning for success. We fully anticipate we'll have millions of customers using our site on a daily basis."

Summary

The WebSphere software platform has better answers than the competition to help you build and run a dynamic e-business. A WebSphere solution helps you capture customer loyalty with compelling user experiences. Even if you don't need these features today, your e-business probably will as it becomes more dynamic:

- *Flexible personalization and portals*
- *Voice-driven applications for phone, mobile and multimedia customer solutions*
- *Mobile support for roving customers and sales forces*
- *Global reach with national languages and automated language translation*

A WebSphere software platform environment provides greater business agility than competitors through more powerful business integration to automate and streamline your business with:

- *More adapters and connectors for application integration locally and across the enterprise*
- *Business process integration that includes workflow modeling and control, in addition to management of documents, messages and transactions spanning the company*
- *B2B integration across complex transaction sets and protocols*
- *Web services used today to create new network-based, plug-and-play business models*

The WebSphere product family delivers greater reliability to run your e-business than its competitors:

- *Quality in hardware and software helps reduce or avoid bottlenecks encountered if using other vendors*
- *Unmatched scalability-vertical, horizontal and across networks*

When you build an e-business infrastructure, the WebSphere software platform offers shorter time to market, greater availability of development resources and better cost effectiveness than its competitors. These benefits result from:

- *A wider range of WebSphere e-business applications and integration tools.*
- *Better standards compliance, including full J2EE certification. IBM has enabled every level of the enterprise with Java technology, making it easier than ever to leverage legacy applications, without introducing products based on preliminary standards that may force later application rework.*
- *More productive development based on a new open workbench environment that supports IBM and third-party tools.*

Overall, WebSphere products cost less initially, to start up and throughout a life-cycle, helping you gain greater ROI. If you happen to be a WebLogic user, you can get help to migrate your applications to the WebSphere software platform from IBM Global Services experts. For some insight into what's involved, you can download (or order) a copy of the IBM Redbook® called *Migrating WebLogic Applications to WebSphere Advanced Edition.* (See For more information in this white paper.)

For more information

For additional WebSphere case studies, visit:

www2.software.**ibm.com**/casestudies/swcs.nsf/topstories
(In the Select a Product/Technology option box, select WebSphere, and click Submit.)

To review the available portlets in the IBM Portlet Catalog, visit:

www7b.boulder.**ibm.com**/webapp/portlets/portletemarketplace

To obtain a copy of the IBM Redbook Migrating WebLogic Applications to WebSphere Advanced Edition, visit:

Publib-b.boulder.**ibm.com**/Redbooks.nsf/RedbookAbstracts/sg245956.html?Open

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