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The WebSphere Store

BY JACK MARTIN

IT shops continue to be challenged by reduced budgets and staff but still need to deliver the same level of services to the enterprise. This conundrum keeps IT directors scratching their heads by day and staring at the ceiling by night. How do you find new solutions that better serve the enterprise while containing budgets and maintaining the status quo? Who has the time to have an endless parade of vendors come in and demonstrate their wares?

The more things change, the more they stay the same. For the past several years the nature of trade shows and conferences has gone through ups and downs, with many people wondering which ones are worth the time and which ones aren't. Many of these events have been combined together – for a variety of reasons such as declining attendance, reduced business travel, and the poor economy – and have now drifted far from their original purpose. Effective trade shows require a definite message and focus. After attending some of the big-name shows in New York, San Francisco, and Las Vegas, you come away feeling like you're leaving the mall rather than a focused tech event. You should come away with more than just some cool chachka for your kids; you should come away knowing more about what you went there to see. I don't mean to say that these events are a waste of time. There are still some very well-meaning and beneficial events to attend and exhibit at.

WebSphere has reached the point at which it needs to be the focus of a major national event for people to be able to really get the full view of where it can be taken as an application environment. A place where under one roof you can see and experience everything the platform has to offer, from the latest from Big Blue to enhanced applications from third-party providers. I believe that WebSphere, more than any other computing platform, needs an event like this because it serves needs at the enterprise level, the user level, and the application level.

To be able to completely leverage their investment in WebSphere, organizations need to be able to understand what the environment is capable of. IBM has introduced some tremendous innovations to WebSphere this year, but a host of ISVs, portal and portlet developers, and other third parties have been equally busy creating some very special things for the WebSphere environment. Wouldn't it be great if we could bring all of these members of the extended WebSphere family to one place so developers and line of business could exchange ideas on how to get the most out of the computing environment they have chosen to run their businesses with? The collective exchange of knowledge at an event like this transforms the event from a marketing exhibit to a springboard for new ideas.

Every day I hear from companies in a myriad of product categories that have some very exciting technology but lack exposure to users who need to find solutions. Users, on the other hand, often don't know where to look. Sure, advertising in publications like this one helps, but advertising only goes so far. People need to be able to see, touch, and feel new technology before they're going to bet their job on it. What should I say to these people? What I would like to say is "You should bring your staff and some of your customers to the most important IT event of the year, the WebSphere Conference."

Consider this for a minute: you need to buy a pair of shoes. Where do you look? Shoe stores, of course. You don't look in the grocery store or at a gas station. Why? Even though they may sell shoes, you're going to have to hunt through a lot of other things that you're not looking for. You look in shoe stores because regardless of what kind of shoes you need, you can be fairly sure that they will have what you are looking for. It's the same with technology. You need to look for what you need in an identifiable place. Sure, you will find pieces of the WebSphere world at many events around the world, but you will also find other things that you are not looking for. Sometimes these events can be so overwhelming that even if the answer you are searching for is there, you may not find it.

I hope that between all of us – the WebSphere community – we can work together to create an event where we can exchange ideas and further the innovations in the WebSphere environment.

And then Ringo turned to Paul and said "I've got a hole in me pocket."

ABOUT THE AUTHOR... Jack Martin, editor-in-chief of ***WebSphere Developer's Journal***, is cofounder and CEO of Simplex Knowledge Company, an Internet software boutique specializing in WebSphere development. Simplex developed the first remote video transmission system designed specifically for childcare centers, which received worldwide media attention, and the world's first diagnostic-quality ultrasound broadcast system. E-MAIL... jack@sys-con.com

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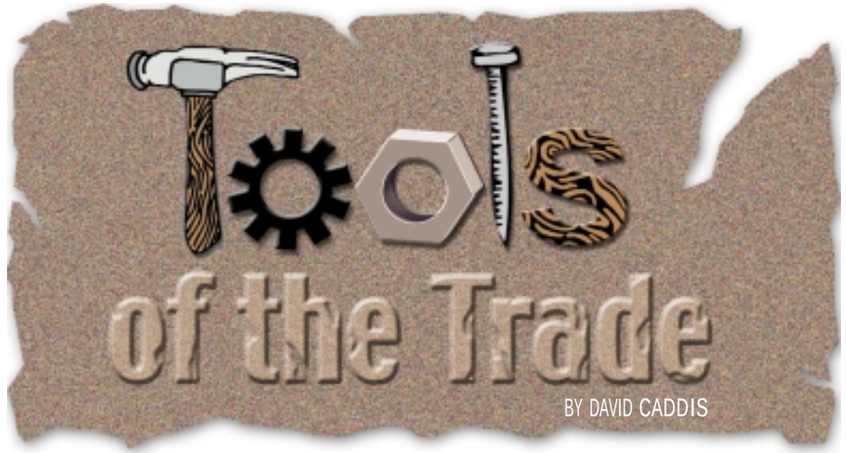

MANAGING AND OPTIMIZING THE WEBSPHERE APPLICATION SERVER

ABOUT THE AUTHOR
David Caddis, vice president of Candle Corporation's Application Infrastructure Management Group, is responsible for products and services that help customers optimize the value they receive from their e-business technology investments. Under the AIM umbrella – which includes solutions for IBM's WebSphere and WebSphere MQ suite of products – Candle provides consulting, services, and tools to help customers build, run, and manage the enterprise application and integration infrastructure upon which e-business depends.

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The rush to architect a new e-business environment required IT departments to meld existing infrastructure with new Web-based systems. To achieve speed to market, IT environments were forged by necessity and quickly retooled to enable Internet-based functionality. Often, these hastily deployed enterprise environments can be complicated, cumbersome, and expensive to maintain. Added system demands, coupled with shifting business requirements, can cause instability and performance degradation that ripples from back-end systems to front-end user interfaces – resulting in a negative impact on the bottom line.

To extend the value of their IT investments, businesses are turning to IBM's WebSphere, a universal Internet software platform, to support flexible IT initiatives and provide the performance and scalability required for e-business. No longer confined to "test-tube" pilot projects, sophisticated application server technologies are becoming a staple in production environments. To make performance benchmarks a reality, key IT stakeholders are increasingly focused on learning how to manage and optimize the performance and availability of the WebSphere Application Server (WAS).

Managers are confronted with a number of products and solutions to enhance WAS performance and availability. Before IT executives can make a best-value assessment, it is critical to consider the merits and capabilities of the underlying management methodology. The foundation of any effective systems management initiative is monitoring functionality. A successful management approach must scrutinize and search for complexities and irregularities in transactions throughout the WebSphere environment, including containers, the Java Virtual Machine (JVM), and Enterprise JavaBeans (EJBs), as well as inside applications that have "borrowed" code from other products, protocols, messages, and the machines used to drive the whole process.

There are several approaches to monitoring operations inside the WAS and across the entire WebSphere environment. The three most frequently used are application instrumentation, the "spy" JavaBean, and the JVM Profiler Interface (JVMPI). While each option has its merits, it is important to choose a solution that can be used throughout the the entire life cycle – design, testing, deployment, and management. Harnessing a single solution for application performance will enable developers and IT managers to work in tandem to align WebSphere applications with business value.

Instrumentation Tools

To optimize application performance, it is important that an instrumentation tool support the requirements of diverse user groups, including developers, testers, and IT operators. Developers and testers require the ability to drill down to the application for coding and tuning requirements. Conversely, IT administrators concerned with overall performance and availability require an enterprise application view.

Ideally, a solution should be able to provide instrumentation without requiring application code changes or compilation. The tool should also provide the ability to enable and disable instrumentation dynamically to control overhead. To achieve a complete picture of overall application performance, organizations must be able to track performance and availability metrics of all key WebSphere environment components.

Once a performance problem is raised, the instrumentation user can drill down to the individual EJB, servlet, or JavaServer Page (JSP) to identify components that have unacceptable response times and high request rates. Each component's performance can be further broken down by type of delay, e.g., EJB, servlet, Java message service, Java naming directory interface, user-defined delay, etc.

CPU usage must also be monitored to gauge true system performance. High CPU usage could be indicative of insufficient hardware to handle the server's throughput or runaway processes. When measuring CPU consumption in conjunction with other WAS performance data, it is critical to ensure that there is a direct correlation between increased workload and CPU use, without suffering unreasonable response times. To accurately determine CPU capacity, maximize the processor speed – close to 100 percent of CPU – while driving increased throughput. Measuring the point of diminished returns for performance and throughput helps IT managers determine requirements for additional processor speed, additional servers for horizontal scaling, or additional application servers for vertical scaling.

With multiple views of application performance, organizations can monitor and assess system health across the enterprise, as well as throughout the life cycle – from development

to testing to deployment to management. For example, pre-deployment use of instrumentation and JVMPI thread-level metrics can help developers and testers find application defects and potential bottleneck components. However, this level of detail would most likely be too resource-intensive and provide too much information for IT management. After deployment, IT management requires summary-level performance and availability information that will facilitate straightforward monitoring of the overall health of the application server and application response times.

To provide a real-world example, an application was performing poorly during a test of WebSphere on OS/390. A developer using instrumentation was able to pinpoint an SQL query at the root of the poor performance. The application was issuing an SQL query that was not properly indexed, which caused each query to scan an entire 2 million–line database table, resulting in response-time delays. To eliminate this problem, the developer first identified the SQL query as the largest delay for the application, then drilled down to view the specific SQL call, analyzed the SQL statements causing the delays, and quickly resolved the issue. Quick resolution of performance slowdowns not only saves time and money but can help increase customer satisfaction.

With instrumentation tools, historical metrics can be stored and used to identify trends and to plan for new initiatives such as migrating legacy records to a new database or identifying areas to increase system productivity. For example, if a new application has an existing sister application that operates in the same environment, organizations should collect data from the existing application to gauge the expected performance of the new application. This approach allows the organization to tune and configure the application to sidestep any performance challenges encountered with the existing application.

However, instrumentation is not a cure-all. The best practice is to use a solution that offers multiple monitoring methods to allow you to look at your WAS from the inside out and outside in. Additionally, relying on only one method of data collection may not be appropriate for the different departments responsible for testing and deploying the application.

The Spy JavaBean: Undercover and Inside the Application

A "spy" JavaBean is a bridging device employed by certain application server management tools. Under this approach, these products leverage an EJB that makes architected J2EE and operating system calls to derive operation metrics for itself and for other artifacts running inside the server. This approach has significant merit in that it sidesteps the requirement to instrument the application itself, as it uses defined interfaces to provide overall metrics. The spy bean approach can also use standard APIs to collect performance metrics. WAS provides performance APIs on certain platforms, including JMX, PMI, and EPM, that can be used to monitor the health of an application server. Additionally, events written to the application server log can be automatically monitored for exception alerts.

However, there are limitations to spy bean application monitoring because the container must be healthy for the spy bean to function properly. Should the container fall into disrepair, the spy bean would lose the ability to communicate with external alert systems, and the manager would be left flying blind. Another drawback is that the spy bean may be tightly coupled to an individual application and could be expensive to maintain. Similarly, performance APIs provide metrics limited to the WAS and do not provide visibility into the end-to-end application performance. Because APIs typically change with technology enhancements, the monitoring tool will likely require updates to support new WebSphere versions.

Using JVMPI

The JVMPI allows for a third approach. Providing for a two-way function-call interface between the JVM and an in-process profiler agent, the JVMPI leverages the virtual machine to notify the profiler agent of various events corresponding to heap allocation, thread start, etc. Alternately, the profiler agent issues controls and requests information through the JVMPI. For example, the profiler agent can turn on/off an event notification based on the needs of the profiler front end. The user can select which metrics to collect from the JVMPI.

The profiler agent also provides the ability to identify lock contention in the JVM by providing detailed metrics about JVM threads. Users are able to quickly identify the threads with the highest CPU percentage used and those with the highest percentage waiting to enter monitor and waiting for an object. High values indicate that work is being delayed because of contention for Java locks. Once an individual thread is identified, further detail is available to determine whether the delay was caused by synchronization, indicating that another thread had exclusive access to the object; or by a wait for notification, indicating that a thread was waiting for another thread.

However, the profiler is not recommended for use in a production environment because its performance overhead limits application response times and scalability. While JVM profiling provides detailed accounting of thread locks, garbage collection, heap sizes, and other thread-related information, it can be resource-intensive and doesn't provide the complete answer to the question of which objects are impacted.

Using WAS to Achieve Business Objectives

WAS is not an island. By definition, the application server is an integration platform. As such, developers and managers must consider application performance across the application server and its connected platforms when creating, deploying, and managing WebSphere environments. Organizations can only gain real insight into e-efficiency, business impact, and ROI by managing end-to-end application performance.

It is important to understand where a Web transaction bogs down. Is it the front end, the back end, or the application server in the middle? To know that, you have to monitor the application server and its connected programs, applications, and databases. Therefore, selecting a stand-alone management product that cannot interface with deployed distributed and legacy applications is a shortsighted approach. While these tools may work well in limited pilots, they are incapable of scaling to support real-world applications that span diverse operating-system and platform ecosystems.

Providing choices in data collection gives an organization ultimate flexibility in adapting an application server monitor to address organizational requirements. As WebSphere initiatives progress from testing to production phases, using a single performance monitoring approach is important to providing continuity as the application evolves through the product life cycle. As all business becomes e-business, selecting the most appropriate application server monitoring and management approach promises to drive not just the success of e-business initiatives but the viability of the organization itself, by ensuring that Web transactions meet customer demand.

A Conversation with Stefan Van Overtveldt

THE DIRECTOR OF WEBSPHERE TECHNICAL MARKETING DISCUSSES WEBSPHERE APPLICATION SERVER 5.0

Stefan Van Overtveldt tells Jack Martin, editor-in-chief of ***WebSphere Developer's Journal****, that WebSphere Application Server 5.0 is "the next generation of application server," and that it offers broad support for open standards and Web services and fosters increased developer productivity.*

WSDJ: DO YOU HAVE A GENERAL ALL-PURPOSE STATEMENT ON WEBSPHERE APPLICATION SERVER 5.0 BEFORE I ASK MY QUESTIONS?

SVO: What we've done with WebSphere Application Server (WAS) 5.0 is come up with a next generation of application server. We've made significant progress in optimizing an application server for four key themes, and in doing so we've also adopted what I would probably call the broadest support for Web services standards out in the industry. That includes a large number of the functions that are defined in J2EE 1.4, which we will be shipping already in WAS 5.0.

The first theme is the creation of a comprehensive built-in, integrated platform – having the application server become more and more an integration server where you can rapidly build applications, define workflows between applications, etc., and link those applications into existing apps as Web services or true connectors. It also means having the ability to take the new applications that you've developed and rapidly expose them for reuse with other applications as Web services.

A second key focus area for us has been the even tighter integration between our WAS runtime environment and the WebSphere Studio development environment, which results in incredible gains in developer productivity. A third aspect is the effort we've thrown into creating a more adaptable infrastructure where you can deploy fairly simple implementations in single-server types of environments all the way up into very complex clustered environments that require extremely high reliability and security in a very smooth migration path. And the fourth is our ability to support a true high-quality infrastructure to run Web services–based applications. This includes our ability to expose Web services in a secure and managed environment, to run Web services over other protocols such as SOAP and HTTP, and to leverage application environments other than J2EE to participate in a Web services world.

WSDJ: DO YOU HAVE REFERENCE CUSTOMERS YET?

SVO: We have about 220 customers that are active in the beta program. We have not gone through the list yet to figure out which customers are going to be reference customers.

WSDJ: ANY IDEA OF WHEN THEY'LL BE STEPPING UP?

SVO: By the time we announce the availability of v5.0, which will be sometime in November, they will be stepping up.

ABOUT STEFAN VAN OVERTVELDT

Stefan Van Overtveldt, director of WebSphere Technical Marketing, manages the technical strategy for IBM WebSphere Application Server and WebSphere Studio. In this role, he has made significant contributions toward the inclusion of Web services technology within the WebSphere product stack, and provided strategic guidance on all aspects of the WebSphere Software platform. His responsibilities also include communication of the WebSphere strategy to key customer and analyst audiences. Previously, Stefan was program manager of e-business Technology Strategy, responsible for setting the business and technical strategy for IBM Software's e-business initiatives. He holds a master's degree in applied economic sciences from the University of Antwerp in Belgium.

WSDJ: WITH WEB SERVICES, WHAT TYPE OF NEW APPLICATIONS WILL CORPORATE CUSTOMERS BE ABLE TO START CREATING THAT THEY COULDN'T BEFORE?

SVO: We see Web services as really the next step in the evolution to open platforms. While J2EE defines the open way of building applications that can run on multiple platforms, Web services really defines an open way to have applications interoperate. Now, the concept behind Web services – which says I can take any type of application, and define how another application should interact with it using an open standard called WSDL (Web Services Description Language), and then, also using open standards, go out and find applications and connect to them – really enables some interesting aspects.

First, you can actually start to look at Web services as a way of building service components across your entire environment. So if you have existing applications, you can put a Web service interface in front of them. If a partner has an interesting application, you can put a Web service interface on top of it. Once you have all those applications defined as Web services, then you can go into a mode of very rapidly building new business logic by combining existing services. So we're moving away from the concept of application development to support new business opportunities to a model of "service choreography" to support new business opportunities.

WSDJ: DO YOU HAVE ANY TOTAL COST OF OWNERSHIP STATEMENTS? HOW THIS VERSION IS GOING TO BE CHEAPER TO OWN?

SVO: We don't have any specific detailed numbers yet, but total cost of ownership is one of the areas we've been focused on very heavily. We've made significant improvement on two fronts: one is we've continued our leadership in performance, which we had already established with WAS 4, by adding even more performance-oriented features into the WAS, including extensions to our caching engine – which we call dynacache – that allow not only the caching of static information, images, page fragments, etc., but also the caching of information that has been generated dynamically, such as result caching for JavaServer Pages, EJBs, etc.

The second one was on improving the overall manageability of the application server, including creating a new management console, which is now Web-based and also very modular. What I mean by that is we've enabled a balance between providing an administrative user interface that is simple to use, versus the requirement at the other end of the spectrum to provide functions for building out highly scalable big-cluster environments. To achieve this, we've created a modular user interface.

With our basic WAS, we ship a user interface that's focused on the administration of a single-server environment. As we go up into our network deployment option, we start to provide functions that have to do with building out clusters, distributed system security, workload management, etc. And finally, as we go into the very high end, we have capabilities to build very large clustered environments where a part of the application is actually being run inside the network, outside of your corporate intranet, and we have the ability to plug those functionalities into not just the application server itself, but into the management console, so that, as an administrator, you only see those functions that are relevant to you and you don't see the complexity that is not targeted at your environment. At the same time, we expose all of the functions that you need if you do have the requirement to manage a very complex runtime environment.

WSDJ: IN REGARD TO POSITIONING VERSUS BEA SYSTEMS, CAN YOU NAME THREE AREAS IN WHICH V5.0 IS SUPERIOR TO WEBLOGIC'S CURRENT OFFERING?

SVO: Number 1 is support for Web services. In WAS 5.0, we provide a full Web services infrastructure – not just support for SOAP and WSDL and UDDI. We also actually provide a private UDDI repository. We provide a Web services gateway, which allows you to provide access to your internal Web service applications to the outside world in a secure and managed environment, or vice versa – provide a managed interface for internal Web services requesters and outside Web service provider applications. We provide the ability to run Web services over more reliable protocols than SOAP and HTTP – such as JMS, IIOP, or MQSeries – and that happens completely transparently to the programmer. We also support a very large number of enhancements in our core Web services capability. That includes support for the latest SOAP parsers. We support the AXIS parser (SOAP 2.3). In our intial testing it shows a dramatic improvement in performance of Web services–based applications. And we support the latest Java specifications for Web services, such as JAX-RPC, JSR 109, JSR 110, etc.

The second one I would mention is our integrated development environment. There's a tight integration between the WebSphere Studio development environment and WAS runtime, so that within WebSphere Studio, for example, there is a testing environment that is a functional WAS, so developers can do all of their testing on their workstation. It all happens right within the developer tools. Another aspect of that is that as we go out and build more and more functionality into the application server, for workflows, as an example, we support all those functions in a single development tool. So within WebSphere Studio you can create JavaServer Pages; build your EJBs; take existing J2EE applications and turn them into a Web service; take existing non-J2EE applications, such as Unix or mainframe applications, and turn them into a Web service; define workflows that bring all of this together – all within the same development environment. Our competitors typically need three or four different development environments to do the same thing – and those development environments are not integrated.

Number 3 is what I would call "platform exploitation." That is particularly the case in our version of WebSphere that runs on our mainframe platform of z/OS, where we fully leverage all of the advanced capabilities, such as Workload Manager, and the Parallel Sysplex environment, and technologies such as hypersockets to provide high-speed

in-memory TCIP communication, etc. To do this, we really had to go beyond simply porting the application server over from a Unix platform like some of our competitors did, and really add functionality to WebSphere to fully leverage the capabilities of this platform.

WSDJ: HOW IS THIS GOING TO HELP YOU COMPETE AGAINST MICROSOFT'S .NET INITIATIVE?

SVO: I think you very correctly point out that .NET is an initiative; WebSphere is a product – and it's available today. If I look at the types of capabilities we're providing right now, I would definitely say that we have at least a year, more likely 18–24 months, head start on Microsoft in terms of building out the middleware infrastructure that supports the entire Web services paradigm – and that is in the area of the Web services infrastructure and our ability to do workflows between Web services.

It also shows in some of the preview technologies that we have to really take Web services out of the *technology* infrastructure and use it to create a *business* infrastructure, meaning a management environment that allows you to actually make money out of the Web services that we offer. We have a project called Allegro, which is running as applications on top of WebSphere v5.0. It really defines a new way of linking your applications to a service provider while negotiating contracts, service-level agreements, etc., and a lot of the components service providers actually need to build and manage the usage of their service infrastructure.

So in all of these aspects, we're very clearly ahead of Microsoft, from an implementation perspective. At the same time, together with Microsoft, we continue to very aggressively drive the further revolution of Web services standards, with things like Business Process Execution Language for Web services and Web services transactions, Web service coordination, etc., all of which, by the way, are supported via the Preview mode in WAS 5.0.

WSDJ: DO YOU HAVE THE BUSINESS PROCESS EXECUTION LANGUAGE IN THERE?

SVO: We have a workflow support. There are two parts to business processes, or workflows. One is the actual execution engine – the ability to link applications together, and we very strongly support it with technologies like transactional workflows, compensation (if you have to back out of a workflow), etc. The second part of this is the actual flow definition language. This is the language that either a programmer writes or a tool generates to define how these different parts of the process need to interoperate. WAS v4 has a flow execution engine and a flow definition language. In v5.0 the flow definition language we provide is our own FDML (Flow Definition Markup Language), which is a precursor to Business Process Execution Language for Web services. We will be adding BPEL4WS support in a future release of WAS, likely as a service pack. The customer will see this as preview technology very, very soon; as part of the product, sometime in 2003.

WSDJ: MOVING FORWARD TO NEXT YEAR, WHERE DO YOU SEE THE CUSTOMERS COMING FROM FOR 5.0 THAT ARE NOT USING IT TODAY?

SVO: Well, I think there are two types of customers. First, if we look at our existing customer base, we have a large number of customers that are still running WAS 2.5 – customers that designed their solution and had implemented it up to the first quarter of this year. There are a lot of WAS 3.5 installs. And since the fourth quarter of last year, we've seen a dramatic pickup in the installs of WAS 4, but those were really new installs. They were new customers. The first thing we think will happen is that the customers who are still running on WAS 3.5 are going to naturally move over to 5.0. There are a number of reasons for this: while we tend to drive our new technology to market as quickly as we can, our release schedule does not necessarily coincide with the schedule that customers manage to get technology implemented.

WSDJ: OBVIOUSLY.

SVO: The second key thing we're seeing is that because of the capabilities we have in terms of Web services support and our highly productive development environment, we still see a very big demand for this product with new customers. And then obviously there's a big trend in the market – and I think this coincides with a more mature app server market – where some of the smaller players are no longer viable, where customers, especially large organizations, have seen implementations of application servers pop up, driven by departments, etc. In those types of scenarios, we really see a big drive toward standardization on a single application server platform.

With the product we have in v5.0, we're definitely a prime candidate for CIOs wanting to make a standardization change. This is very clearly illustrated through some of the reports that came out from analysts such as Salomon-Smith-Barney, etc., that did surveys of CIOs from Fortune 1000 companies, which clearly state that when people are looking at standardizing on a single application server, WebSphere is chosen by a factor of 5 to 1 over any of its competitors.

WSDJ: HOW ABOUT THE SMB CUSTOMER WHO ISN'T USING YOUR STUFF OR ANYBODY ELSE'S? WHAT'S IN V5.0 THAT'S GOING TO MAKE THE COMPANY DECIDE TO START USING AN APPLICATION SERVER?

SVO: There is a new addition to the WebSphere family, called WAS – Express. This product is really optimized for the SMB environment or for departmental use. Its focus is on ease of application development through support for things like server-side Java scripting, wizard-driven development, and the fact that we provide a very large number of sample and template applications that you can use to very rapidly build out a solution.

This product also comes combined with a development tool that, again, is focused on simplicity and ease of use. Administration and install have been greatly simplified. Our install, for example, is literally answering three questions, and you're up and running. Administration is through a very simple browser-based interface, and we really feel – based on the feedback we've gotten, not just from customers in the SMB market, but also from Business Partners in this market – that this is clearly a product that will make a significant impact to our position in this market.

WSDJ: SO WHAT WOULD THE TYPICAL CUSTOMER LOOK LIKE WHO ISN'T USING AN APPLICATION SERVER NOW? WHAT WOULD THEY SEE THERE THAT WOULD MAKE THEM DECIDE TO GO? OBVIOUSLY, THE BULK OF THE SMB MARKET IS NOT RUNNING APPLICATION SERVERS FROM ANY VENDOR.

SVO: There are a number of reasons a customer may decide to go here. Reasons such as "I need to create an Internet presence," "I want my customers to be able to check on my inventory," or "I want them to be able to find out where I am in the production of the order I'm building for them." So that's a definite type of usage we're getting.

We're also finding we see a lot of ISVs in this space. We see a lot of requirements for new types of applications – whether it's general accounting packages or other packages, etc., – to be run on an application server platform with a browser interface, simply because it's a lot easier to administer and it's a lot easier for an ISV to just deploy an application once and then just provide a URL to the internal use of that application. Other implementations are things like an internal employee portal for the SMBs, etc. So we provide a lot of capabilities right out of the box, but at the same time we're also very actively involved in our Business Partner Channel, which provides solutions on top of WAS.

WSDJ: WHAT DO YOU THINK IS THE MOST POPULAR TYPE OF ISV APPLICATION CURRENTLY RUNNING WITH WEBSPHERE?

SVO: It really varies by industry. In the finance industry we actually see financial applications such as applications from a company like S1, for example, running on top of WebSphere. In other industries we see a lot more focus on using WebSphere as a portal into an existing ISV application. So it's really hard to draw the line on what is the most popular type of application. One thing is sure – we have definitely moved beyond where we were in the early stages of the business when application servers were used as front ends to existing applications. Right now we see significant investment in ISVs – and customers, by the way – building completely new applications to run on top of WebSphere.

WSDJ: IS THERE ANYTHING ELSE THAT YOU'D LIKE TO ADD TO THIS?

SVO: One comment I think I definitely want to make is that our strategy has been to really maintain a market-driven perspective of what type of functions we're needing to add to WebSphere, how we're going to market the product, etc. It's definitely paying off for us. If you look at where we were at the end of last year – the consensus at that time between analysts, whether you were looking at Giga or Gartner , etc. – their consensus analysis was that we had basically caught up with BEA and were sharing the market lead. Since then, we've significantly outgrown the market at 53% year-to-year growth in the first quarter, 17% second quarter, 25% third quarter – in a market that is growing by 6–7% at best. So we're definitely picking up more market share – and the only way to do this is to take market share away from our competitors.

by Candle Corporation

Omegamon XE

for WebSphere Application Server

BY ANTONIO VILLAFANA

Omegamon XE

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TEST ENVIRONMENT:
Win 2000 (SP2) machine running WebSphere Application Server Advanced Edition 4.01

ABOUT THE AUTHOR

Antonio Villafana, president of e-Mind Solutions, has over 12 years' experience in the computing industry. His wide-ranging experience includes 10 years of military service, IBM certifications, software design, and business process automation.

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Developers deploying applications to WebSphere Application Server (WAS) now have something to be "fired up" about. Candle Corporation, a systems management and business integration company, has packaged a powerful and intuitive performance monitoring tool called Omegamon XE for WebSphere Application Server, a potent tool for optimizing the performance and availability of WAS. Omegamon XE has brought some much-needed usability and functionality enhancements to performance monitoring software.

Remember that Omegamon XE server should be installed on the same machine as the WebSphere Application Server. The installation and configuration of Omegamon XE is not straightforward. Let's just say there were too many knobs to turn. Also, a licensing key must be obtained from Candle before installation is complete. The installer will prompt you for a trial key, which you can obtain from www.candle.com/www1/websphere trial by completing a registration form. The key will be sent to you via e-mail and will enable the product for 30 days from the date you registered for it. There is a limit of five trial keys per company. (The company name is determined from the domain name in your e-mail address.)

After installation, there are no shortcuts on the desktop or under the start menu for accessing the help files and documentation. I would highly recommend reading the documentation provided on the installation CD. I found the product documentation in the following folder: "<CD Drive>:\DOCS\ PRODUCT\KWE101". After installation, I extracted two PDF files – "Getting Started Guide" and "User's Guide" – to my desktop. Once installation is complete, I would also recommend creating a new application instance just for testing and familiarization. Best guess – you will need it!

A new application instance is created by selecting "Create Instance" from the "Actions" dropdown menu in the "Manage Candle Services" window. You will be prompted to assign a name for the new instance and to configure its properties (see Figure 1). Double-clicking on any item in the "Parms" list of the "Configure Application Instance" window will launch a dialog box similar to the Windows registry key/value dialog box. You can modify values to match your application characteristics and requirements.

An instance can be easily removed by right-clicking on the instance name in the "Manage Candle Services" window. For testing purposes I used the PetStore sample application shipped with WAS.

Monitoring

Omegamon XE offers an enterprise-level GUI interface and the ability to customize workspaces that are tailored to your (customer's) desired views (see Figure 2). Workspaces can be customized for visually identifying potential application bottlenecks (not that your apps contain such things).

For those who have relied on IBM's performance monitoring tool, Resource Analyzer, shipped with WAS, one very noteworthy enhancement in Omegamon XE is that it uses less system resources for collecting and refreshing the Java Virtual Memory (JVM) statistics. Note that the JVM workspaces on Omegamon XE are blank initially, and therefore need to be populated by activating the JVM profiler. Information on how to activate this is located on page 61 of the "Getting Started Guide."

Omegamon XE uses a client/server architecture in which the server is the repository for all workspaces and related data. To reduce the overhead of collecting all JVM stats and refreshing workspace views at startup, several fields on the Workspace display are left blank. JVM stats can be collected and displayed by setting the instrumentation levels using the "WAS SetIL" Take Action commands in Omegamon XE. There is a section in the "Getting Started Guide" titled "Setting Instrumentation Levels to Collect Performance Data."

Omegamon XE's very intuitive design provides the ability to create customizable views and set thresholds for the JVM and related application server statistics, such as the ability to

view database connection pooling stats, transaction commit rate, servlet request rate, and JVM memory usage from a single window. From this single window, you can pinpoint possible application bottlenecks and quickly identify potential memory leaks. A couple of usability features that should be immediately pleasing to Omegamon XE users are its single-window drill-down menu and user-friendly design. Most of the application defaults should be acceptable for small- to mid-range size mission-critical applications. Omegamon XE can be launched from a Web browser or executed as a stand-alone desktop application.

Alerts

Candle included a Visual Programming Module that lets system administrators define complex conditions that can be evaluated without requiring coding. By simply dragging and dropping icons, users can create alert rules for monitoring attributes such as performance, resource, and workload. But be aware that with this feature, you should know exactly what attributes are needed before setting alerts. It may take some trial and error to get this right.

I would not recommend using alerts for finding bottlenecks and locating possible application degradation points. You can build very complex alerts using correlations with AND/OR Boolean logic. However, alerts will not give you a correlated reason why application or system faults occur, e.g., memory leaks occurring because database connections are not being closed by a renegade session bean that is only loaded when a certain servlet method is called. The specified system administrator or user will receive alerts via e-mail or on the server desktop when a predefined (Omegamon XE) or user-defined threshold has been exceeded.

System administrators can also specify a set of predetermined routines to be executed at regular intervals. These routines or tasks can be executed without requiring the presence of a system administrator or user.

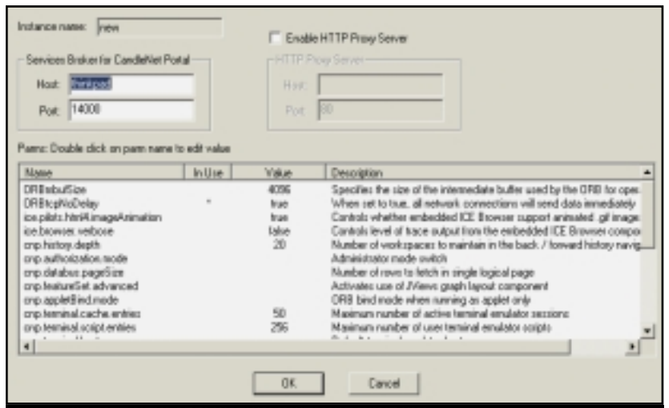


FIG. 1: CREATE NEW APPLICATION INSTANCE WINDOW

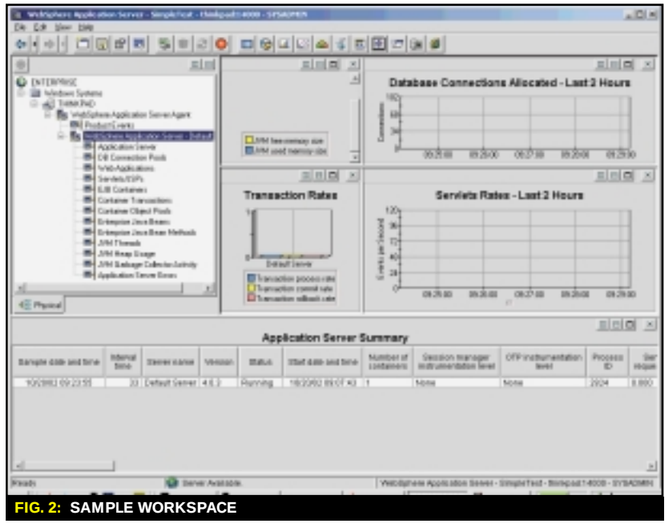


FIG. 2: SAMPLE WORKSPACE

Conclusion

There is light at the end of the tunnel! Candle's Omegamon XE gives IT departments a much-needed tool for taming mission-critical and resource-intensive applications. Web-based applications are prone to slowdowns and are very difficult to debug. Omegamon XE can help you locate performance degraders such as ghost database connections, creation and removal of EJBs and servlets, and unexpectedly large object pools. This product is an excellent choice for WebSphere architects.

Omegamon XE Platform Coverage

OMEGAMON XE for WebSphere Application Server is available on AIX, Sun Solaris, NT/Windows 2000, and OS/390.

OMEGAMON XE supports WAS Advanced Edition versions 3.5.x and 4.0.x, and WAS Enterprise Edition v3.6 on the distributed platforms mentioned above.

OMEGAMON XE for WebSphere Application Server for OS/390 supports 4.0.x on the mainframe. However, the following editions are not supported:

- WAS Standard Edition 3.5 (mainframe)
- WAS Advanced Single Server Edition 4.0 (distributed)
- WAS Advanced Developer Edition 4.0 (distributed)

Excerpted from Chapter 9: Test Environment Construction and Tuning

Performance Analysis for Java Web Sites

A good stress test uncovers any problem areas before deploying the web site to production. The time and expense of performance tests pays off in the gains realized in customer satisfaction and overall site reliability. So far, we've discussed building good performance tests for your web site. Now let's cover building a realistic environment in which to run these tests.

In short, you cannot go cheap in building your test environment. Poor infrastructure impacts performance and stress tests more than any other type of tests you'll run against your web site. Don't expect to meet your web site performance goals if you build the test environment with cheap cable, underpowered client machines, and low-bandwidth networks. To get the most out of your performance test efforts, the test environment must mimic the production environment as closely as possible, given the ever-present constraints of time and expense. Obviously, if the web site contains hundreds of servers, you cannot recreate a huge server farm for a performance and stress test. In these cases, scale down the test to a few machines, keeping the scale proportional to the production system. Figure 9.1 shows a typical small test cluster with peripheral systems.

Proportion remains important in "scale environments" in other ways as well. Again, if the 20 machines in the production cluster use 200 database connections, assume that the small cluster of two machines needs 20. The same goes for network bandwidth, test clients, and other resources you might need for the test. Also, when using a smaller environment, keep in mind the behavior of the system at two servers might be drastically different than with twenty. The web site team must test scalability in a small-scale environment.

Of course, the reduced costs of small-scale environments lead to reduced coverage of all the situations your large-scale web site faces in production. If you test with a small-scale environment, you may encounter undiscovered problems when you move to production. In fact, you may encounter problems you can only recreate on the production web site. The best test environment remains a full-scale reproduction of the production web site, whenever possible.

The Network

The network plays an enormous role in performance and stress testing, yet it rarely receives the attention it requires. The network often becomes a hidden source of problems and limitations during the test. Only after days or weeks of fruitless testing and problem resolution of higher-level components does the network come under scrutiny. Consider the network before testing begins. Estimate the amount of data the network must carry and plan sufficient network capacity for testing.

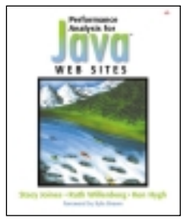
NETWORK ISOLATION

As always, we want the test network as close as possible to the production setup. However, even if the production environment shares its network with other systems, build an isolated network for the stress and performance testing. Some companies balk at the expense and time that building an isolated network requires. However, without an isolated network, you cannot control the traffic volumes on the network during testing. We're often amazed at some of the traffic moving across an internal network, even during normal business hours. A few of the things we've seen in the field include

- Heavy network traffic from employees connecting to a company-sponsored gaming server
- Network "storms" created by a faulty network card somewhere on the network
- Massive system backups moving across the network for hours at a time.

In short, if you don't control the network, you don't control its traffic, either. Figure 9.2 shows some of the daily network traffic fluctuation factors. Some test teams try to work around this problem by running their tests at night or early in the morning. Sometimes this works, but often they discover their company uses the network 24 hours a day. As mentioned earlier, the networks might be in use at night for large data transfers and back-ups.

If you must use a non-isolated network, try to set up a network protocol analyzer (more on how these work below) to monitor network traffic volumes. Before you do this, check with your corporate net-



ABOUT THE BOOK

Performance Analysis for Java Web Sites by Joines, Willenborg, and Hygh

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Stacy Joines, Ruth Willenborg, and Ken Hygh

work team. Many companies restrict or forbid the use of network protocol analyzers on their networks. And, yes, they can find out if you install one anyway. The best solution remains building an isolated network.

Remember, you need repeatability to perform an effective performance and stress test. Some test teams, however, cannot get the same results twice from the same performance test, even if they don't make any adjustments to the system under test. In such an environment, you cannot effectively tune the system. If you make a change, and see better performance, you cannot know if you've found a legitimate improvement or if the environment actually factors in the solution. Testing on an open network introduces more environment variability than you can ever hope to control.

Network isolation is probably one of the most overlooked issues in performance testing, and yet it is one of the most important. If you can't know from one run to the next whether a change made improved things or not, your test dissolves into an exercise in dart-throwing as you struggle to understand your web site bottlenecks and optimal tuning.

NETWORK CAPACITY

The network carries all the data for the test (and subsequently for the production environment). You need to do some network capacity planning prior to building the network, and certainly before beginning any tests. The network needs enough capacity to carry the data generated by the test. This begs the question: What data does the test generate, exactly? Here's a list of some common data packages the network handles during a performance test:

- User/server communications
  - User HTTP requests
  - Server HTML responses
  - Embedded HTML page elements, such as gifs, jpegs, and JavaScript
  - Embedded frame elements (usually resulting in additional page requests)
- Mid-tier (server-to-server) communications
  - HTTP session data sharing within a cluster
  - Application database transfers
  - Traffic to services servers (for example, a stock quote server)
  - Traffic to mail/messaging services
  - LDAP requests/responses
  - DNS requests/responses
- Back-end (server-to-host) communications
  - Host databases transfers
  - Host application communications

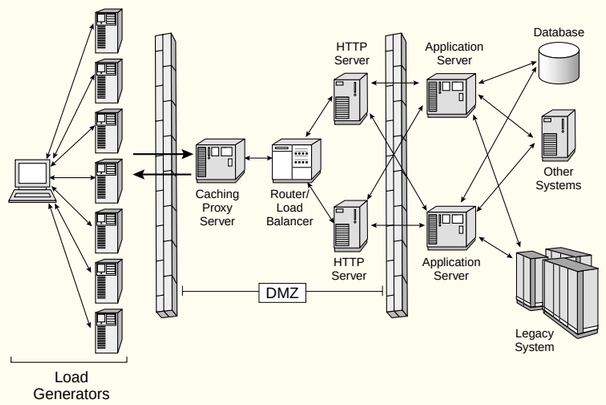

FIG. 9.1: AN EXAMPLE TEST ENVIRONMENT

Usually the largest network impact comes from a few major sources:

- HTML responses
- Embedded elements such as gifs and jpegs
- HTTP session data sharing within a cluster
- Application database transfers

However, as we've discussed before, every web site and web application differ. A good understanding of your particular web application, the kinds of pages it returns, and its interactions with other systems helps you put together a reasonable network traffic estimate.

E-COMMERCE NETWORK CAPACITY PLANNING EXAMPLE

e-Commerce web sites require lots of network bandwidth. As we discussed in Chapter 5, the pages returned by these sites usually contain lots of embedded pictures in the form of gifs and jpegs. Users browse the pages of the e-Commerce web site and perhaps search for groups of items ("Show me a selection of coffee pots," for example). Because these pages return items the customer probably hasn't seen before, the user's browser does not contain cached copies of the images. To build a network estimate, figure out the average and maximum page size returned to the users. Decide how frequently the maximum page size might go out to the users, and whether it merits special calculation as a worse case scenario. Again, this exercise results in estimates. Use the performance test to validate these estimates.

Let's make the following assumptions about our e-Commerce site:

- Average page size: 45KB
- Maximum page size: 70KB

Let's also assume you want to use a 100Mbps Ethernet network to support the web site. If the web site team hopes to move 100 pages per second through the site at peak (remember, we always plan for peak loading), the network receives sustained traffic of 4.5Mbps.

```
45,000 bytes per page * 100
pages per second = 4.5MBps
```

Note that 4.5MB approaches the upper bound of sustained traffic we consider acceptable for a 100Mbps Ethernet web site. Under ideal conditions, a 100Mbps network could potentially handle 12.5MB of sustained traffic:

```
100Mbps / 8 bits per byte =
12.5MBps
```

However, Ethernet networks lose efficiency because of traffic collisions and retransmissions. Academics tell us to expect an Ethernet to support 66% of its potential capacity, or about 8.3MBps of sustained traffic. For planning purposes, we prefer to use a more conservative estimate of 5MBps of sustained traffic. This allows the network to absorb unexpected traffic spikes. Web sites operating through a switched network are the exception to this rule. A switched network acts as a point-to-point network, which makes it more efficient. When dealing with switched networks, we raise the planning estimate to 8MBps.

The 4.5MBps we estimated above tells us the peak outbound traffic on the web site. How much inbound traffic does the web site carry? Inbound traffic consists of HTTP requests, which we usually measure in terms of a few bytes. For example, if the average HTTP request requires 100 bytes, the network load generated at peak is 100 bytes/request * 100 requests/second = 10KB/second.

This is less than 1% of the outbound HTML content traffic. Keep in mind that TCP/IP generates lots of overhead packets to support "guaranteed delivery" (a hallmark of the TCP/IP protocol). So, as a rule of thumb, we estimate inbound traffic at about 20% of outbound traffic. In this case, we'll use a planning estimate of

```
4.5MBps * 20% = 900KBps
```

Now, let's consider the transfer of data between the application servers and the application database on the network. Let's assume each user request requires the transfer of 10KB of data from the database. At peak, this gives us the following traffic:

```
10,000 bytes per request *
100 requests per second =
1MBps
```

If the web site uses HTTP session persistence, we need to account for this traffic as well. If each request generates 1KB of HTTP session traffic, we estimate the following HTTP session burden:

```
1,000 bytes per request *
100 requests per second =
100KBps
```

Lots of installations grossly underestimate the size of the HTTP session data they maintain for each user. Check the HTTP session database, and check the size of the data stored for your users to properly size the average HTTP session. See Chapter 2 for more details on HTTP session management.

Other factors also influence the amount of HTTP session data on your network. HTTP session caching combined with affinity routing reduces the data read from a persistent HTTP session store. On the other hand, if your application server vendor supports a distributed HTTP session scheme, this sometimes generates more network traffic, depending on the implementation.

The network burden estimates so far add up to the following, as shown in Table 9.1.

At 6.5MBps of sustained traffic, this web site exceeds our planning limit of 5MBps for the 100Mbps Ethernet. The web site needs a more sophisticated network plan. We might consider a switched 100Mbps network rated at 8MBps, but this doesn't give the web site a lot of room for growth or for unexpected load peaks. A gigabit network might be a better fit for this web site.

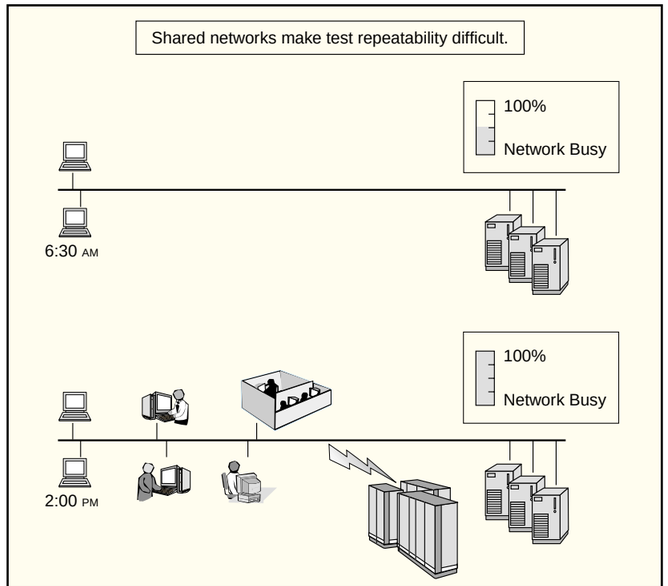

FIG. 9.2: SHARED NETWORK IMPACT

DATA	NETWORK BURDEN
Outbound HTML/static elements	4.5MBps
Inbound HTTP requests	900KBps
Application data transfer	1MBps
HTTP session data transfer	100KBps
Total	**6.5MBps**

TABLE 9.1: ESTIMATED NETWORK TRAFFIC BURDEN

NETWORK COMPONENTS

Networks consist of more than cable. Any number of switches, routers, load balancers, and other equipment make up the test environment network. The brands and types used largely depend on what's available for the test, as well as company standards. Frequently the test team reuses network equipment from other test projects or receives the equipment as a loan from a production group. Often, the equipment becomes a part of the test network without anyone really understanding how it works or how to configure it properly. The end result is a piece of equipment that may impact web site performance in ways difficult to detect without specialized monitoring equipment and skills.

Keep in mind the following questions when dealing with network components:

- Is the component rated for this network? We regularly find customers trying to use network equipment rated for a 100Mbps network on a gigabit network. Also, your diagnostic equipment, such as network protocol analyzers, may not work with ultra-high-speed networks.
- How was the equipment used previously? Borrowed equipment often contains filters, limits, and other settings still in place from a previous assignment. For example, if you borrow a router previously used in a production web site, its current settings may intentionally limit HTTP connections to a defined maximum. While this protects against denial of service attacks in production, it limits the load you're able to generate against the web site during the test. Review the settings on all equipment to avoid unintentional limitations on performance.
- Does the component support all the features the test environment requires? Routers, load balancers, and other components may or may not have features required by the web site. Know your requirements for key features such as affinity routing and SSL support, and understand how well the equipment supports your desired configuration.

NETWORK PROTOCOL ANALYZERS AND NETWORK MONITORING

A network protocol analyzer monitors traffic flows across a network and allows you to find out exactly how much traffic passes over the network during a test. If permitted, we highly recommend you use a network protocol analyzer to validate the network load during testing. Don't be surprised if your test generates a very different network load than you originally estimated. Often your estimates fail to consider all the factors at play during execution. Also, you may find the page sizes you used for your estimates incorrect.

Network protocol analyzers vary greatly in sophistication and expense. The most expensive network protocol analyzers cost tens of thousands of dollars and work with high-speed networks. These high-end network protocol analyzers usually come with tools for analyzing the network traffic at various levels in the protocol stack. For test teams on a more limited budget, many free or inexpensive network protocol analyzers exist, and they usually run on a machine already connected to the network. They provide limited functionality and don't always work with high-speed networks. However, for providing a gauge of network activity on many classes of networks, these tools work just fine. Just be sure whatever tool you pick works with the network it will monitor. This requires checking the tool's tolerance for network type and network speed. Chapter 12 discusses these tools in more detail, and Appendix C contains a list of some vendors of these products.

Warning: Many companies actively monitor their networks for network protocol analyzer activity. Some companies consider a network protocol analyzer a breach in their security and do not allow them. We've visited companies where using a network protocol analyzer on a company network results in instant job termination. Please take this warning seriously; obtain permission before inserting a network protocol analyzer into a network.

The Servers

The network connects all the components of your web site. Let's next go up a level and consider the server components you need in the test environment.

APPLICATION SERVER MACHINES

In terms of configuring the web application servers, strive to make the test configuration as close to the deployment configuration as possible. If you're deploying to a farm of four-way Sun machines with 8GB of RAM, you should use the same equipment during your testing, if at all possible.

Even though the Java web application server might port to different platforms, web applications do not perform and scale the same on a one-way NT box as on a four-way Sun box. If you must choose between fewer servers for your test or smaller servers, pick fewer servers. When you use fewer

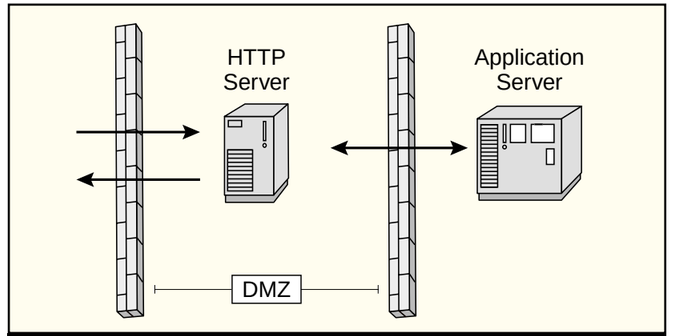

FIG. 9.3: TYPICAL DMZ CONFIGURATION FOR APPLICATION SERVERS

BOOK EXCERPT

servers, scale the other components of the test (databases, HTTP servers, and so on) proportionally as well.

If you deploy the web application on multiple machines in a cluster, then test on multiple machines in a cluster as well. Get a representative number: If you plan to deploy on more than four machines, test on more than two. If your target environment contains eight application server machines or more, then four application servers in your test environment should suffice, as long as you scale the rest of the test web site proportionally to match.

We often encounter test teams trying to test and tune all the software used in their web site (application servers, databases, HTTP servers, etc.) on a single machine. However, this technique doesn't work if the production web site actually uses multiple machines. For example, many production web sites separate their HTTP servers from their application servers. Often the production team places the HTTP servers in a DMZ with firewalls in front and behind, as shown in Figure 9.3. It is impossible to successfully performance test for this configuration with a single server machine. If the web site uses SSL, for example, the HTTP server needs so much CPU for encryption/decryption that it chokes the performance of the application server.

DATABASE SERVERS

Most production web sites use mid-tier database servers to hold application data or data specific to the web site (such as an HTTP session database). Often the web applications access these databases on every user request. Despite their central role in the operation of the web site, the mid-tier databases sometimes receive little or no tuning before the site enters production deployment. Often the test team lacks the database administrator (DBA) skills required to tune the database properly. Thus the team ignores the database unless they stumble across a specific problem in production. The problems we see frequently with databases usually fall into one of two broad categories: Poor software configuration or poor hardware configuration.

Poor Database Software Configuration: Indexing

By far the biggest database tuning problem we encounter is poor table indexing. Usually the problem starts this way: The test team receives a database backup from the production database staff. They dutifully load the database definition and the data itself, but never bother to build indexes for the tables they've just loaded. In fact, they may not even know what an index is, much less how to build one. Chapter 6 discusses how to put together the performance test team, including DBA skills needed to tune environments using databases.

The index allows the database software to find elements in a table without scanning the table repeatedly. This saves tremendous amounts of resource, particularly CPU. Also worth noting, the DBA may build new indexes and remove old ones as usage patterns change over time. New indexes apply even when web applications use existing databases. Often these databases contain indexes tailored for existing applications, but they might require new ones to better support the web application. By monitoring database reports, the DBA determines the web application's usage patterns and makes appropriate adjustments. The DBA may also review the SQL used in the web application to find out where indexes might be most beneficial.

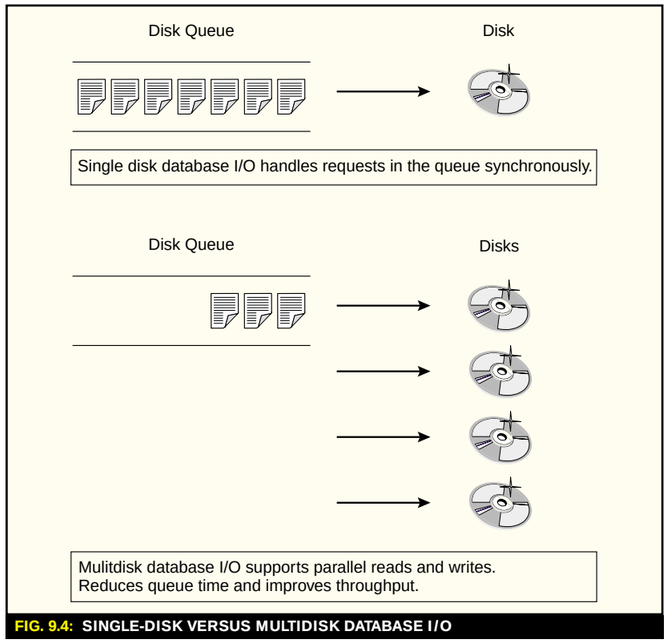

FIG. 9.4: SINGLE-DISK VERSUS MULTIDISK DATABASE I/O

Poor Database Software Configuration: Internal Resources

Web applications receive many simultaneous requests. In turn, they make a proportionally large number of simultaneous requests to the database servers supporting them. These database servers need enough resources to support large volumes of simultaneous requests. These resources include things such as buffer pools, cursors, and sockets to support high-bandwidth operation.

Regrettably, we often see high-concurrency web sites struggling to pull data from databases tuned for small, fat client applications. New applications and usage patterns require a fresh look at the tuning parameters for the database. Do not assume the database is tuned properly because the DBA made a few tweaks some years ago for the usage patterns of a fat client application.

Poor Database Software Configuration: Caching

Particularly for sites with enormous application databases, the database cache becomes very important for optimal site performance. The cache holds the results of the most common queries and makes an impact on sites with large catalogs of items but a few frequently accessed "best sellers." These items return from the cache quickly without an expensive retrieval from the hard disk.

Caching helps some web sites, but a few cannot take advantage of this feature. For example, if every query submitted by the web site is unique (if, say, every query contained the user's account number), the cache may not return a hit even though the query may return items retrieved many times before. The web site team might want to work with the DBA to build queries better able to use the caching mechanisms available.

Poor Database Hardware Configuration: I/O Management

Eventually, all databases interact with the hard disks to read or write data. Database tuning often focuses on the CPU required by the database server without focusing on how to manage the storage required by the same database. We sometimes see very large multiple-processor database machines spending most of their time waiting to access one tiny hard disk. Adding CPU does not solve disk I/O problems.

If the database server spends most of its time waiting to read or write from the disk, tune the I/O resources. If the database supports it, try adding a multiplatter disk array to the database server. By using multiple disks, the database spreads out the read and write operations for better simultaneous access. The database reads and writes spread out across multiple points rather than queuing up on a single disk. Figure 9.4 shows an example using multiple disk platters.

Likewise, the hard disks themselves often contain tunable features. Some disks allow the system administrator to specify buffering to the disk, which may also improve performance. Some databases write more efficiently to disk than even the native file system itself. For example, IBM's DB2 database product provides mechanisms for "raw" I/O management (DB2 bypasses the file system to write directly to the disk) and for multidisk data writing.

Finally, when spreading the data to multiple hard disks, don't forget about the database logs. Databases keep detailed logs for rollback and recovery purposes. Every action taken by the database must be logged, and this requires a write to the hard disk. "Striping" these logs across multiple hard disks, if supported by the database, often improves disk I/O wait times.

Managing performance of WebSphere-based Web services environments

Key Challenges and Solutions

BY FRANK MORENO

The explosion of Web services has spawned significant new challenges for IT operations and the technologies they use. As the infrastructure requirements for WebSphere applications continue to get more complex, the addition of Web services suddenly expands the management focus to systems and applications that may reside outside of IT's control.

ABOUT THE AUTHOR

Frank Moreno is the product marketing manager for Dirig Software, a developer of award-winning enterprise performance management solutions. Frank has over 10 years' experience in product marketing, product management, and strategic alliances in the networking and software industries, and has written multiple articles on e-business performance management.

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Technologies are evolving to address these requirements with solutions that monitor the various application dependencies, integrations, and layers for WebSphere environments through a combination of component-level monitoring, correlation/analysis, and transaction mapping. This article highlights the challenges IT faces in maintaining Web services performance, the solutions currently available to assist IT, and the industry/technology requirements and standards needed to extend the reach of management tools to fully support Web services.

Current State of the Industry

While Web services products are currently the focus of global IT leaders (IBM, BEA, Microsoft, etc.) and multitudes of start-ups as well as the hot attraction for many venture capitalists, the adoption of Web services technologies within the enterprise continues to be slow. Nearly every IT analyst firm predicts Web services will experience tremendous growth and acceptance over the upcoming years. Today, however, companies that are experimenting with Web services are taking a cautious approach.

IDC recently published reports that highlight this trend, stating:

- Four out of five enterprises intend to undertake Web services projects over the next three years, and nearly one in four have already completed an internal solution using Web services.
- Organizations plan to utilize Web services for a variety of business solutions; however, integration involving internal and external systems currently tops the list of functional uses.
- Web services market share is still up for grabs: roughly 20 percent of respondents are currently undecided about which vendor to rely on.

Early implementations by current adopters are solving business problems today, but more important, vendors are looking at them to help identify future requirements. Many of these highlight the need for additional standards to ensure interoperability between the various technologies. Currently the Web services standards portfolio is rapidly increasing in size to match functionality requirements, yet the area of management remains vague and incomplete.

Web Services Standards Evolution

The evolution of standards for Web services has come in three phases. The first or "connection" phase involved laying out the core, baseline standards: the XML Schema, SOAP, WSDL, and UDDI. These standards – the building blocks of Web services – are now in place, through the efforts of such standards groups as W3C, WS-I, etc.

The second and perhaps most complex phase is focused on security and reliability. In this phase, WS-I is working on critical Web services specifications like XML Digital Signature, XML Encryption, HTTP-R, SAML (Security Assertion Markup Language), and XACML (eXtensible Access Control Markup Language). Additionally, groups such as OASIS, WS-I (Web Service Interoperability Organization), and others are all working to present additional guidelines around these specifications.

The third, or "enterprise," phase will address provisioning, transactions, workflow, and systems management. Unfortunately this phase is in the very early stages of discussion, despite being one of the primary concerns among enterprise organizations.

Managing WebSphere-Based Web Services: What Does It Mean?

There are currently multiple interpretations of what the phrase "managing Web services" means. Some companies (i.e., Actional and Infravio) offer products labeled "Web services management" for the integration and distribution of Web services, ensuring version control, change management, provisioning, etc. Additionally, there are still two interpretations specific to performance and availability management within the Web services market.

Recently the OASIS group announced its OASIS Management Protocol Technical Committee. The intent of this committee is to facilitate distributed systems management over the Internet by sharing management information as a Web service and integrating various management tools such as network management, systems management, application and component management, etc. IT managers view this initiative as the next SNMP, offering a common language to communicate performance management information. This will likely be driven by companies that offer an enterprise console for management data (example: Managed Objects), and niche management tools that will adopt an inexpensive way of offering integration into many enterprise management products.

Critical to the success of managing Web services are the performance and availability of the infrastructures required to successfully deliver a Web service. Other than security, performance and availability are often the primary concerns among those companies considering Web services initiatives. Currently there are no standards in place for monitoring and managing the performance of Web services; however, many groups, including DMTF (Distributed Management Task Force), WS-I, W3C, OASIS, and others, are investigating and drafting requirements.

Management Requirements for Delivering Web Services

Like any "service-oriented" IT solution, the success of a Web services transaction depends on two separate infrastructures to be performing optimally. The service requester first depends upon the availability of the Web services registry. The requester then relies on the availability of the provider and the performance of the provider's environment. Finally, the requester is always dependent on the overall integrity of her/his own infrastructure.

Additionally, the service provider is responsible for ensuring that all of its services are available on demand. Any time a service is down, that can typically translate into lost dollars. The provider must also offer acceptable performance levels to prevent requesters (customers or partners) from changing to a competitor. While availability is an absolute requirement, performance levels will be what differentiate one provider from another and will serve as the basis for internal and external service level agreements.

However, as stated earlier, there are still no standards in place to enable the manageability of Web services applications and infrastructures.

Challenges for Existing Management Tools

There are many challenges facing traditional management tools when attempting to ensure performance and availability of Web services. When integrating separate tools to address the many different elements within the infrastructure, IT is still left without visibility into various critical components.

IT managers will often default to systems management tools for their infrastructure monitoring of Web servers, portal servers, Web application servers, and database servers. Network management tools will provide protocol monitoring for such things as SOAP, HTTPS, FTP, e-mail, and TCP/IP. Component management tools may provide metrics on the performance and availability of JSPs, servlets, EJBs, and JDBC connections. Yet while this approach may address some needs within an enterprise environment, there are a number of issues that remain, including:

- The breadth of coverage with many of these tools is likely to be limited, creating issues for diverse operating systems, application server platforms, middleware, and database technologies.
- Many traditional tools are not designed with or for Internet technologies such as HTML, XML, HTTPS, and JMX.
- Most enterprise management products fail to deliver a business-centric or process-centric view into transactions, as well as

a developer's view into the probable cause of issues within their Java code.

- The use of proprietary APIs with many tools can result in incompatibility with standards such as SNMP (Simple Network Management Protocol), XML, or even SOAP and WSDL.
- Enterprise management tools are often too invasive of the infrastructure, whether it's a large framework solution, heavy probes and modules on managed servers, or instrumentation and profiling within Java applications. Tools for Web services must be lightweight solutions that offer low overhead, and nonintrusive monitoring for minimal performance impact.
- Web services environments will likely create high volumes of events, alerts, and observations, as well as massive amounts of historical performance data. Traditional tools will often create infrastructure performance bottlenecks when handling a large volume of metrics. Web services require scalable solutions capable of growing with anticipated volumes of data.

Leveraging Existing Technology – JMX

Existing technologies can be leveraged to help fill the void of performance management for Web services. The JMX (Java Management Extensions) specification defines the architecture and API requirements that provide Java developers with the ability to implement and expose the management functions of distributed applications. Through the use of JMX, Java-based applications can be queried and monitored during runtime to expose performance and availability information within individual Java components. New management solutions optimized for Web services environments now provide the ability to communicate with Java applications using JMX.

Management of Web services environments is available today through the use of JMX. By monitoring a JMX-enabled SOAP runtime, a management application can consume many critical performance attributes within a Web services infrastructure, including the total number of Web services deployed and the total number of calls to all services combined. Additionally, data can be monitored from individual services as well, including successful invocations, the number of invocations per method, the number of failed invocations, and average response times.

To accomplish this requires only two specific monitoring solutions and a free developer's tool. To monitor the network, new solutions from companies like SMARTS, Concord Communications, and Micromuse offer scalable solutions designed for Internet environments, and provide the flexibility of standard protocols and APIs to allow for easier integration.

To enable the SOAP runtime with JMX, IBM offers the Web Services Tool Kit. This award-winning development tool is available free as a downloadable solution from IBM's alphaWorks emerging technologies Web site. Within version 3.2.2 of the Web Services Tool Kit is a JMX-based management Web service. "An update of the Web service management demonstration includes a new JMX-based management Web service that allows MBeans stored within a JMX MBean server to be accessed and manipulated from a remote console. This technology allows a single console to monitor the status of JMX-enabled services and components throughout an enterprise through an AXIS (SOAP) client interface."

The third, and most important, product needed to manage a Web services infrastructure is a management solution designed to monitor application server environments, including the operating system, Web applications, and components. Products are available on the market today that provide comprehensive management of performance and availability of application server environments, including CPU, memory, file system, JVM, servlets, EJBs, and methods. In addition to the provider's infrastructure, information can also be ascertained from the registry's response time using SOAP, HTTPS, and TCP/IP, as well as the performance of individual services such as response time and invocations.

This combined approach to proactively managing Web services provides users with the scalability and functionality needed to ensure services are performing at optimal levels. While there are many solutions on the market capable of providing monitoring of application server components, few can combine those features with the ability to monitor, threshold, and act upon any MBean within any JMX-enabled application, as well as the ability to monitor specific Java method calls for measuring response times or invocations. The ideal product for this type of environment will also provide this monitoring information in business-centric views, such as the health or success/failure ratio of a particular service, as well as views for both IT and development.

A Web services industry analyst firm, The Stencil Group, in their report, "Understanding Web Services Management," summarizes the need for management with functional elements for services management solutions. Within the category of runtime monitoring and control, they suggest that companies look for alerts and exception events, heartbeat (continual monitoring of availability), performance metering, and service prioritization. Despite the lack of standards pertaining to management of Web services for WebSphere environments, leveraging JMX and the combined solutions mentioned above addresses each of these needs today, while providing additional detail to prevent service failure or at least immediately determine the probable cause of issues and notify the appropriate users.

Resources

- IDC Web Services Awareness and Adoption Study (2002). "Ready and Willing, but Able?" IDC #27736.
- *Web Services Toolkit FAQ:* http://alphaworks.ibm.com/aw.nsf/FAQs/webservicestoolkit
- *W3C Web Services Architecture Requirements, Working Draft 11; AC018 Management and Provisioning:* www.w3.org/TR/2002/WD-wsa-reqs-20021011
- The Stencil Group (2002). "Understanding Web Services Management."www.stencilgroup.com/ideas_scope_200206wsmgt.html

A Talk with Mike Colleary of IBM

BUSINESS PARTNERS, WEBSPHERE, AND PROFITABILITY

WSDJ editorial board member Jim Martin recently sat down with Mike Colleary, vice president of IBM Software Channels, Americas, to talk about WebSphere.

WSDJ: PLEASE GIVE US A THUMBNAIL SKETCH OF YOUR ROLE WITHIN THE ORGANIZATION.

MC: I'm the vice president of IBM Software Channels and Small/Medium Business (SMB) Sales for the Americas, that is, United States, Canada, and Latin America. I report to Barry Gibbons, vice president of Americas Software. Channels include all IBM Software's Business Partners and all sales and support coverage resources for SMB software customers.

WSDJ: SO YOU GO ACROSS THE DIFFERENT IBM SOFTWARE BRANDS?

MC: Yes, IBM's middleware software brands. This encompasses IBM's industry-leading WebSphere, DB2, Lotus, and Tivoli portfolio of software products. I am responsible for Business Partner middleware software sales and SMB software sales throughout the five regions that segment the Americas geography. Business Partners cover all sizes of customer accounts, not just small- and medium-size businesses. Our Business Partners are deployed to cover IBM software's sales opportunities.

Let me explain a little further: we have established a two-tier distribution network of Business Partners (BPs). This distribution model ensures that we have the right kind of sales and support infrastructure and BPs in place to achieve our software business objectives and complement the BPs' hardware systems and services businesses. This two-tier sales model begins with an effective set of value-added distributors (VADs), such as Pioneer/KeyLink, Arrow/SupportNet, Avnet, Ingram Micro, Tech Data, and SYNNEX. These distributors have a network of solution providers and resellers that make up the second tier of this distribution model.

I have a channel sales and support team that is responsible for the VADs because they work with these firms to ensure they have effective reseller recruiting programs, demand-generation marketing programs and campaigns, training, and technical support programs. They are also responsible for administrative tasks such as presales support for configuring and processing orders. In support of the tier-two solution providers and resellers, I have another sales team that focuses on their role in our important sales infrastructure. These tier-two BPs traditionally create an e-business solution to address a customer's business requirement, build a value proposition for a customer, show the customer how this solution will solve their business problem – by building a prototype "proof of concept," close the sale, and deploy the e-business solution with their services-capable resources. My BPSMs (Business Partner Sales Managers) make up the team that supports these BPs. In addition to these sales teams, I have business units that are responsible for BPs across the entire spectrum of the software business sales cycle.

Our Telesales organization creates customer demand, qualifies sales leads, and provides operating efficiencies. IBM telesales centers are located in Atlanta, Toronto, Dallas, and Cambridge. IBM's telesales phone specialists are the main point of contact for customer inquiries that result from our advertising and marketing campaigns. The person on the phone will qualify the customer, determine what business solution the customer needs, and then identify a BP that can deliver the solution and close the sale.

Other Business Partner types that are part of this sales coverage model are systems integrators or consultants that may recommend what software technology should be used for customized applications, and independent software vendors (ISVs) who build software applications that use our scalable, reliable, and flexible middleware software, such as the WebSphere brand products. There are also OEM (other equipment manufacturers) who embed our software in their products. A good example would be ATMs or speech products for future automobiles. We have five regions of sales coverage, complemented by IBM brand sales and technical support resources to ensure our customer and Business Partner opportunities and support needs are addressed. Overall it is a very comprehensive sales coverage model, to say the least.

WSDJ: DO YOU SEE A LOT OF ENTHUSIASM FROM THE PARTNERS ADOPTING WEBSPHERE?

MC: A tremendous and continually growing enthusiasm. WebSphere is leading the way in the marketplace with our Business Partners. If you look at IBM software channels history, many of our Business Partner relationships started with our Lotus brand prior to IBM's acquisition of the world leader in collaborative computing software. Over the past few years we have increased our BP network and focused the expansion on skills required to sell our other three brands: WebSphere, DB2, and Tivoli. However, the impressive annual growth and the significant customer demand for the WebSphere brand has been dynamic.

One of the key technologies driving the market right now is WebSphere. The transformation and integration capabilities of WebSphere are allowing our customers to leverage existing technology investments and build for the future. WebSphere allows for more rapid deployment, which means faster time-to-value. When I look at any of my opportunity pipeline management reports, they are always dominated by sales activities in WebSphere. Our biggest sales challenge is ensuring we have the WebSphere sales and technical skills to meet the demand of this marketplace. Since our BP base was established on Lotus-based solutions, we have the required number of certified skills for this brand. We are well behind for WebSphere and Tivoli but it is a priority with our BPs in every sales region.

WSDJ: DO YOU SEE A LOT OF YOUR BUSINESS PARTNERS MAKING A BIG PUSH TO GET THEIR TECHNICIANS CERTIFIED ON WEBSPHERE, AND ARE THEY SEEKING OUT TALENT FOR THEIR WEBSPHERE PRACTICES?

MC: Certifications are not just a "nice-to-have" item; certifications are a "must-have," because our support programs and business plans are built around the critical skills required to drive product sales based on e-business solutions. Business Partners have to make significant resource and skill commitments to participate in our PartnerWorld programs and get the extensive and differentiating benefits from these programs.

WSDJ: HOW DO YOU ENCOURAGE THEM TO DO THAT?

MC: In addition to sales leads that IBM brings to our BPs, we build business plans with them based on the opportunities they forecast for their part of the marketplace. Because of these opportunities and related e-business services, they create the justification to recruit or develop the skills to support the needs of the marketplace. The key is, we don't just have a BP program where you sign up and sell. IBM Software's Business Partners programs are built on partner sales incentives, significant support and leverage from IBM and our brand sales, and technical support resources. The commitment we require from our Business Partners is that they will build the skills, solutions, and deployment services required to help us penetrate the marketplace and satisfy customer demand for our software products.

WSDJ: SO BOTH SIDES ARE REALLY PLAYING TO THEIR STRENGTHS IN TERMS OF THE PARTNER/IBM RELATIONSHIP?

MC: That is exactly right. We put a lot of investment into incremental resources on the WebSphere brand in terms of enablement, sales and support, and demand creation. We find opportunities and qualify them. We determine which Business Partner has the right business solution, involve them in the sales opportunity, and mentor them in the initial engagements so we can transfer skills during the sales process.

In addition to these resources, we also have territory-based sales reps who provide sales coverage and develop account relationships. These reps work to complement what our Business Partners do and generate incremental business. We also have a dedicated software account team of sales reps that focuses on the larger customer accounts. This team builds customer relationships and works with our customers to create their e-business strategies based on key software brands like WebSphere. Business Partners are also part of these sales because they have solutions and services that customers need to implement their IT infrastructures.

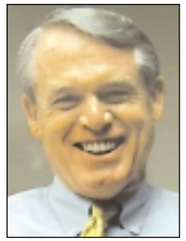
WSDJ: IN TERMS OF DRIVING WEBSPHERE SALES, WHAT ARE THE KEY ELEMENTS YOUR PARTNERS MUST PURSUE AND ACCOMPLISH FOR YOUR GROUP TO BE SUCCESSFUL?

MC: They must be very responsive to the IBM-generated sales leads and customer opportunities that IBM creates. They also must cover the marketplace where IBM doesn't have traditional coverage and generate incremental revenue opportunities. They need to develop unique solutions for these customers. In the small and medium business market segment, many of these customers do not have their own IS department. The Business Partner *is* the "IS shop" for these customers, and IBM's primary coverage for these new-acquisition customers.

WSDJ: WHAT DO YOU SEE AS THE TOP MOTIVATORS FOR YOUR CUSTOMERS TO SELECT WEBSPHERE RIGHT NOW?

MC: IBM just introduced a new version of its portal software – specifically designed for the SMB market – that is easy to install and use, and affordable to buy and maintain. WebSphere PortalExpress software was designed in close consultation with IBM Business Partners because they understand the needs of small and medium businesses. With only a few clicks of a mouse, customers and IBM BPs can customize a page layout, add a new portlet, add a new user, or completely change the portal's interface. IBM is enabling all of its SMB portal customers to benefit from low per-user pricing, not just those businesses with sizeable user communities, as some of our competitors require.

This new offering, in addition to the entire WebSphere portfolio of products, gives our customers robust and scalable software technologies that they can build their IT infrastructure around. Customers are seeing industry solutions that work, and the ROI they require in today's challenging marketplace. The channel motivation is the opportunity to make money in this difficult econo-



ABOUT MIKE COLLEARY

Mike Colleary is vice president, Software Channels and Small/Medium Business Market Segment, responsible for IBM software sales and marketing support for IBM business partners, and market segment owner for software sales in the U.S., Canada, and Latin America sales regions. Mike joined IBM in sales and had several sales, management, and marketing support positions throughout the U.S. before being assigned to Tokyo to develop the channels strategy for IBM's Asia Pacific region.

Later he was appointed director of emerging markets for the IBM Software Group for the Asian/Pacific and Middle East/Africa areas.

In 1999, he was appointed worldwide director, Partner Development, IBM SWG, responsible for IBM's successful global, national/regional system integrators, and value-added distributors alliances.

my. WebSphere market demand helps our partners expand their business profitability. WebSphere allows a BP to get to customers that are interested in IBM's industry-leading WebSphere products. They develop the prototype solution, cost-justify the e-business solution, and then use their services skills to deploy these solutions. A recent consultant study on BP profitability showed that for every $1 spent on IBM middleware, our Business Partners generate $21 in related hardware, software, and services. That is a compelling value proposition that our Business Partners like.

WSDJ: WHAT DO YOU THINK MAKES A CUSTOMER CHOOSE ONE PARTICULAR BUSINESS PARTNER OVER ANOTHER?

MC: First, you have to have the right e-business solutions that differentiate one partner from another. You have to think "customer first," and build a reliable, affordable solution that delights a customer and one that will be a reference for other customers. A customer always wants the assurance that the solutions being proposed have worked for other customers and that they have yielded the ROI that was used to justify the customer proposals. Last, the BP must have certified skills that will ensure an effective implementation of the e-business solution.

WSDJ: IN TERMS OF DEMONSTRATING THE ROI TO A CUSTOMER, IS THAT SOMETHING YOU RELY ON YOUR PARTNERS TO DO, OR IS IT SOMETHING YOU REALLY DO IN CONCERT WITH YOUR PRODUCT SPECIALIST, YOUR PARTNER, AND YOUR CUSTOMER?

MC: It depends on the customer and who identifies the opportunity. If it is a partner-led opportunity, then the BP creates the value proposition directly with the customer. They will use IBM resources when needed, as part of the overall recommendation for the customer. If IBM identifies the customer requirement, and we have brought our BPs into the sales opportunity, then we will do the sale together because the partner brings the applications and service elements for the total customer solution.

Many of our partners have IT services practices that go after different segments of the market. These unique specialties differentiate one partner from another and allow IBM to cover most of the customer requirements for e-business solutions throughout the marketplace. Customers are looking not just for the latest in technology but to learn how to use these technologies to address their business problems. They want to know how they can ensure that the technologies can be deployed effectively so they can get their expected return on their investment.

WSDJ: IN TERMS OF THE CUSTOMERS YOUR ORGANIZATION IS ENGAGING RIGHT NOW, DO YOU SEE ANY PARTICULAR VERTICALS THAT ARE MORE RAPID ADOPTERS THAN OTHERS?

MC: You always see different industries adopt technologies at a different rate and pace, depending on the technologies. In today's marketplace, with technologies like WebSphere's portfolio of middleware software, you don't just have a one-size-fits-all mentality. You see financial firms wanting to be at the front end of the technology curve so they can expand their customer base and the services they can offer their customers. In the distribution industry, customers want to build a better supply chain mechanism between their suppliers and their customers. Also, in the manufacturing industry vertical, customers want to improve their operating efficiencies and broaden their capabilities. You can't just say that one industry will adapt technology ahead of another because there are too many variables involved in e-business technologies.

WSDJ: WHAT LEVEL OF IMPORTANCE DO YOU THINK CUSTOMERS ARE PUTTING ON THE USE OF OPEN STANDARDS FOR WEB SERVICES, AND IS THIS INFLUENCING THEIR DECISIONS ON IT TECHNOLOGIES?

MC: Customers consider things like open standards to be very important elements of their e-business solution decisions. There isn't one dominant platform, whether it is a server system or an operating system or middleware in the marketplace. Most customers have a mixed IT environment. They need to ensure their vendors have open standards that support their mixed environment; otherwise, they are boxed in from a technology viewpoint and would have to "rip and replace" if they want freedom of choice on their use of IT technologies. Obviously, rip and replace is costly and very disruptive to their business. Customers want to be able to say "What is the best solution available today that I can implement in my current environment efficiently, effectively, and quickly?" If they have to implement different standards each time, then they are somewhat restricted on what technology they can use to address their business requirements. Open standards give our customers freedom of choice.

WSDJ: WHAT DO YOU SEE AS THE MOST IMPORTANT THING PARTNERS CAN DO TO BE SUCCESSFUL WITH THE WEBSPHERE PRODUCT LINE?

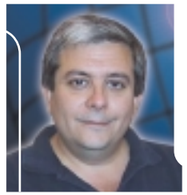
MC: The most important thing BPs can do is to show customers that there are business solutions that the BPs are developing or customizing that are open, scalable, reliable, secure, and easy to implement. Fortunately, these are all characteristics of the WebSphere brand. Security in development has become key in e-business solutions, and customers are focusing on this in their solution decision-making process.

WSDJ: I'M SURE THAT FROM THE FINANCIAL INDUSTRY YOU'RE SEEING A LOT OF CONCERNS.

MC: In every industry – especially the transportation, manufacturing, distribution, government, and financial services industries – security has become a necessity rather than a nice-to-have element of a business solution. Everyone in business today has a heightened sense of urgency due to what happened on 9/11 in New York and Washington, D.C. Customers want to make sure that their mission-critical business solutions are secure and protected, so that others cannot penetrate their systems and do things that will disrupt their business.

WSDJ: IS THERE ANYTHING ELSE YOU WOULD LIKE PEOPLE TO KNOW ABOUT WHAT YOU ARE DOING?

MC: The real key to what we are doing, from an IBM software perspective, is to ensure that we have Business Partners that have the capabilities to build robust e-business solutions for our customers and that IBM middleware solutions are profitable for our Business Partners to build their business applications and services practices on today and into the future. We are committed to our coverage strategies, and we are making progress on our business goals. We couldn't do it without our Business Partners.



ABOUT THE AUTHOR

Jim Martin has worked in the system integration and communications industry for the past 15 years. Working on design and implementation teams, he has been instrumental in deploying Web based mission-critical systems.

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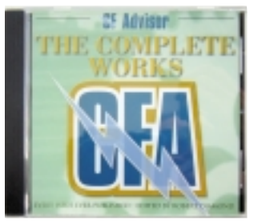

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The Titanic As a Case Study

WebSphere and the challenge of Internet projects

BY EMILY BRUNER AND MARK KOZAK-HOLLAND

ABOUT THE AUTHOR

Emily Bruner, information developer for iSeries AD Solutions, IBM Software, develops XML documentation for WebSphere Development Studio Client for iSeries. Emily has also tested and helped modify software products by working with members of Development and Solution Validation. A recent graduate of the University of Waterloo in English and philosophy, Emily pursues writing, piano, and electronic music in her spare time.

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Delivering IT projects on time and on budget is not enough in today's world. You also need to be online – and this means connecting to the Internet. With that come the high expectations of your customers and partners, and the rigors of a "24-7" online e-business operation.

Until recently, Web and non-Web business systems were mainly detached from each other. The IBM e-business initiative and the WebSphere family of products enhanced the ability of businesses to integrate their Web-based systems with their non-Web systems to produce a single enterprise-wide system. Now that many businesses are online, organizations are restructuring their hierarchies so that the IT organization reports directly to the finance organization. Many CFOs are becoming responsible for approving new IT projects in organizations – and therefore ultimately responsible for the delivery of business services to customers.

On-line, On-time, On-budget: Titanic Lessons for the e-business Executive is a book by Mark Kozak-Holland about delivering IT projects, using the Titanic as a historical case study to give the issues more meaning and relevance. Although technology has changed immensely in the past hundred years, human faults, judgment errors, and project management oversights still endanger the success of many business operations. This article draws upon the themes of the book, outlining the steps you can take to ensure the success of your IT project, and giving examples of how WebSphere products such as WebSphere Edge Services Architecture, WebSphere Site Analyzer, and WebSphere Studio can help you complete these steps.

The list below summarizes the tasks that exist for any IT project, as a guide to planning and operating your e-business:

- Review the issues
- Determine how the IT project aligns to the business
- Find out which parts of the infrastructure need investments
- Determine which safety features you need to incorporate
- Plan and execute the testing stage
- Make sure that the online operation is ready to run
- Determine any necessary contingencies

What Are the Issues?

According to the classic 1998 report from Standish Group, "CHAOS: A Recipe for Success," only 26% of all IT projects finish on time, on budget, with all the features and functions originally specified. However, this is only part of the overall picture, as many problems only surface when the IT project is implemented, sometimes many months or even years into the operation. Even though the quality of individual technologies has improved by an astounding rate, the reliability of business services has not kept pace. Every month we see examples in the press of very well-publicized service outages that cost organizations hundreds of millions of dollars.

Why do IT projects have such a high project failure rate and why are business services so difficult to deliver? There are many reasons highlighted by the Standish Group report. One of the fundamental reasons is the impact of the Internet. IT projects today are going "online" through intranets, extranets, the Internet, portals, or other electronic channels. As an organization moves its operations online, it exposes the inner workings of its business operations to potentially millions of customers, partners, and suppliers around the world. IBM WebSphere Edge Services Architecture version 2.0 is designed for technology specialists who want to manage e-business sites on a Web server while maintaining tight security, reducing server congestion, increasing availability, and improving server performance.

Why Use the Titanic?

Organizations are discovering that IT projects are too critical for business executives to ignore. Through the course of any IT project, hundreds of critical decisions are made that affect the overall implementation and operation. Stage by stage, an executive needs to be aware of where the project risk is, what decisions are critical, which activities require tight control, and what business representation is required. So how do you present key concepts to an executive so that he or she can take an active role? One approach is through a historical case study, to cut away the layers of IT jargon and complexity. The project life cycle from the Titanic is not much different from those used in IT projects today. Purists in the IT industry may beg to differ, but fundamentally they are the same. There are many specific analogies from the Titanic's short history that map very well to the many challenges and decisions encountered in designing, constructing, and operating an online operation.

The Titanic's construction took four years, yet in the course of four days the doomed ship was sent to its grave through a number of bad decisions. Modern interpretations of the Titanic's story point to the inadequacies of technology and the shortage of lifeboats. However, this is very misleading, as practically all safety features were compromised before the ship was launched. During its maiden voyage, rules and procedures were inadequately tested, incorrectly implemented, and blatantly violated by the very people who were ultimately responsible for the ship, its safety, and that of the passengers and crew. This provides a very important lesson for modern complex service delivery environments, as today's e-businesses face analogous challenges.

The classic HTML model is continually being stretched as e-business organizations grow in scope and impact through the constant additions of new Web applications. Competitive pressures force businesses to include more dynamically generated and personalized Web content. Both enterprises and service providers are searching for new models for scaling applications while avoiding degrading response, overloads, and failure points.

A comprehensive solution also requires uninterruptible infrastructure. Even a minimal service disruption can make today's demanding clientele flee to a more appealing online service. Business managers who fail to provide adequate, highly responsive, stable business services capable of withstanding the onslaught of weekly changes required will lose demanding customers ready to switch or "click" to a competitor. Outages have become horrendously expensive and highly visible because of the exposure of the Internet. Continuous business service availability is becoming a major competitive advantage, and this raises the bar for IT projects that already have a notoriously high project failure rate.

How Does the Project Align to the Business?

In the first stage of the project you should question how the IT project aligns to the business, articulates the business problem or opportunity, and specifies the solution, as well as its overall value to the organization. This includes the business risks of the Internet, and setting up a go/no-go decision on whether to proceed with online operation. Similarly, the Titanic case study examines the origins of the Titanic project, how it was conceived, the business drivers behind White Star's decision to replace its aging fleet of liners, and the competitive business strategy to win passengers. The project was financially justified through a cost/benefit analysis that underpinned the expected levels of service.

Providing comprehensive e-business leadership, WebSphere evolves to meet the demands of companies faced with similar types of challenges such as the need for increasing operations efficiencies, integrating disparate systems, and strengthening customer loyalty. The WebSphere family helps businesses develop and manage high-performance Web sites and integrate those Web sites with new or existing non-Web business systems, focusing on three general types of businesses, ones who want to:

- Use the latest technology to establish a powerful Web presence or upgrade their current Web presence
- Develop distributed, enterprise-wide business systems and applications
- Integrate their Web presence with their non-Web systems and applications

Deciding Where to Invest in Your Infrastructure

In the second stage you can ensure that the business view is etched into the functional requirements and design, and that the online operation is architected with the appropriate levels of availability to protect it according to nonfunctional requirements supported by the business case. This requires the project team to verify critical areas and components in the architecture, to prepare for more granular decisions in the next stage. The Titanic case study looks at the formation of the main functions and design of the ship. It examines how competitive business pressures led to a spotlight on these functional requirements, with a priority for luxury and splendor over everything else in the quest to design a palatial hotel.

The WebSphere Edge Services Architecture ensures that your project is built to withstand similar pressures in a modern framework. The file-sharing component is an enterprise file system that enables cooperating hosts to share file system resources across both local area networks and wide area networks, providing nondisruptive real-time replication of information across servers, to ensure data consistency, availability, global stability, and quality of service.

The approach distributes a portion of the application processing workload to the edge platform as part of an integrated end-to-end application framework. WebSphere Site Analyzer, available as an add-on to Edge Services, can monitor, analyze, and report on Web site usage to shed light on visitor interactions with the site, helping turn raw data into valuable business intelligence and assist with capacity planning.

Choosing Safety Features

In the third stage you can ensure that critical areas and components are protected adequately by selecting from a comprehensive list of availability techniques (software, hardware, and process). This includes looking at high-availability

CASE STUDY

ABOUT THE AUTHOR

Mark Kozak-Holland, a senior business consultant for IBM Global Services, Canada, specializes in helping organizations evaluate how enabling technologies can impact their business and enhance existing business processes for the customer. Mark has over 19 years of systems integration and services experience. Mark has recently written an e-business book, *On-line, On-time, On-budget, Titanic Lessons for the e-business Executive*. Mark holds a BSc degree with Joint Honours in Computer Science and Statistics from the University of Salford, UK.

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advantages and disadvantages, the best circumstances for each technique, and of course, the costs. This also requires reviewing some of the challenges around the complex integration of the online operation with the back-end systems in the environment, completing functional unit testing, and preparing for nonfunctional testing in the next stage.

The Titanic case study looks at the construction techniques and compares the selection issues of proven versus new technology to protect critical areas of the ship. As the construction neared completion esthetic factors were allowed to compromise the nonfunctional requirements. As a result, the safety features and the design of ship were fundamentally flawed. For example, the height of the bulkhead walls was too short, the double-skin bottom was below the waterline, and maritime regulations were also hopelessly outdated by the rapid evolution of shipping technology.

In the construction phase of your technology solutions you need to take into account all safety features to prevent disasters from occurring. The following list outlines the Edge Server's safety features:

- An enhanced cache improves response time by offloading back-end servers and displaying links as forward, reverse, or transparent proxy, while validating dynamic content and caching fragments and variants.
- Load balancing improves site availability, scalability, and performance by clustering edge, Web, and application servers, and managing site selection, session affinity, and transparent failover.
- Security features help you centralize security policy administration using Tivoli SecureWay Policy Director, and the Edge Server authenticates users and authorizes access to Web resources protected with SSL encryption.
- Bandwidth management monitors usage and resolves conflicts through quality-of-service or service-level agreements in the event of overload.
- Site partitioning subdivides sites for management by multiple parties while presenting a single system image.
- Filtering permits or denies certain types of traffic to and from endpoints in your network.

Setting the Stage for Testing

In the fourth stage you can ensure that there is a plan for testing the online operation. This involves planning the level of dynamic testing required, selecting the right kind of tests, and preparing the test environment. The focus is on nonfunctional requirements first. The planning will be for either testing an isolated new solution, a new solution that is integrated to an existing solution, or a new solution that is replacing an existing solution. The business executive needs to understand the risks associated with the incoming change, the potential impact to the environment and business services. The "Berlin Wall" approach to change management, which forces all changes through one or two tightly policed checkpoints, is not feasible in today's highly dynamic business climate.

The Titanic case study looks at the testing or sea trials undertaken, specifically the limited operational and safety testing. With its sister ship, the Olympic, already operational, extensive sea trials and testing were not considered critical. However, the Olympic was involved in several serious incidents, including a major collision with HMS Hawke. The Olympic had gone into dry dock for repairs, and as a result there was pressure to get the Titanic into operation to make up for lost revenues. The Titanic was rushed into production, with limited sea trials and testing, and the operational readiness of the crew for the maiden voyage was poor.

To avoid analogous dangers of putting a business online before it is ready, testing of your Web application is made simpler by the WebSphere Test Environment (WTE). Offered as a component of WebSphere Studio and WebSphere Application Server, WTE tests your Web applications before publishing them to the external server. With the WTE Servlet Engine, you can run and configure multiple Web applications to fully mimic how they will behave in the real world. The WTE's control center is a central location to start, stop, and configure services. It offers a lightweight runtime environment that loads quickly, includes all-in-one unit testing, has no dependency on any external server or database, and can debug live server-side code using the workbench debugger, included with WebSphere Studio.

Preparing to Go Live

You can ensure that the testing is done according to plan to determine the robustness of the online operation. Through extensive nonfunctional (and some functional) testing, use the test environment to determine your system's overall integrity, availability, and potential impact to the surrounding service delivery environment. Once all the tests are passed, you prepare to "go live," which delivers a fully tested and working solution into the live service-delivery environment. The Titanic case study examines how on leaving the port, the ship had a near collision with the steamer New York, to the consternation of passengers and crew. This highlights the challenges the crew had in navigating a very large ocean liner. Only one lifeboat drill was performed and the lookout's binoculars, vital operational tools, were missing. The testing stage, therefore, is a critical part of the project life cycle, as typically this is where any warning signs of a potential failure will become visible. At this point the business service metrics and measurements are set up, and the service level objectives and agreements are established and agreed to by all parties.

Along with the WTE, the integral functions of Edge Services make it easier for you to put your application into production. It manages your installation and configurations, operates the server remotely, and reports events. Content distribution deploys published Web content from staging servers to hosting servers across a network, including executables and fragments. Availability monitoring checks which application components are functioning, and makes sure the client's request goes to a fully functional server.

Assessing Your Implementation

In this stage you can ensure that the organization has been set up to successfully run and deliver the online operation and service delivery environment. The project should not end as soon as the service is operational, but only after a proven level of stability is attained. Business executives need to know the impact of the implementation on business services and the risk of remaining live. The Titanic had a number of built-in feedback mechanisms that, unfortunately, were discounted, fudged, or just ignored. For example, ice warnings that were eventually communicated through the hierarchy to the captain weren't adequately acted on, and the captain succumbed to the director's pressure to sail at full speed through the danger area. As a result, the ship ground itself onto an ice shelf.

Learning from this, businesses executives need to know how to create a support infrastructure, maintain smooth and stable running operation, and prevent disruptions from occurring, or at least minimize them through a quick recovery method. This is based on a rapid and accurate problem management process oriented around a "speed-of-recovery clock" in getting the operation back online as quickly as possible. This should also include strategies for early-warning systems and automation, eventually leading to self-monitoring, self-healing, and self-balancing systems.

Edge Services provides sophisticated detection of system utilization and error events across multiple networks and servers. Simultaneously, it provides caching of content while automating the replication and mirroring of application data, so that even if your Web site experiences downtime, you are given an adequate cushion for quick problem solving. In addition, all local content can be debugged, published, and tested on any of the staging servers before deploying to the external site.

Disaster Recovery: Planning for Contingencies

You can ensure that disaster recovery is considered. This requires a why/what/how approach; that is, understanding why disaster recovery is critical, what disaster recovery entails, and how to determine whether a disaster is occurring. The executive needs to know what the current business continuity plan is, how the plan will address the incoming implementation, and what the risks are in the plan.

This requires looking at business continuity planning and issues such as application selection, recovery windows, and cost justification. It also reviews the techniques available through extended mirroring and remote replication. The Titanic's officers clearly did not have a business continuity plan. Much precious time was lost in the first hour after the collision, as the disaster was assessed. Poor communication ate up time for passengers and crew to react. Effectively, the impact and stock-taking phase was atypically lengthy as senior members of the crew operated in a state of disbelief.

What happens if your Edge Server experiences downtime? From the user's point of view, nothing unusual happens, so you are not facing a disastrous situation. Availability implies the automatic detection and bypass of component failures – in routers, networks, firewalls, LAN segments, switches, adapters, application servers, databases, and all of the software that runs on or through them. It provides continuous workload review, reallocates resources, duplicates components, and plans for redundant capacity to absorb extra workload.

Conclusion

The most successful IT projects do not happen by accident. Executives and IT professionals can draw on all these points and stages to make their own conclusions before approving another IT project. They are now in a better position to question or even challenge IT projects, become full participants in the creation process, and better assess operational readiness and understand its impact on business services. After all, they are ultimately responsible for the online operation.

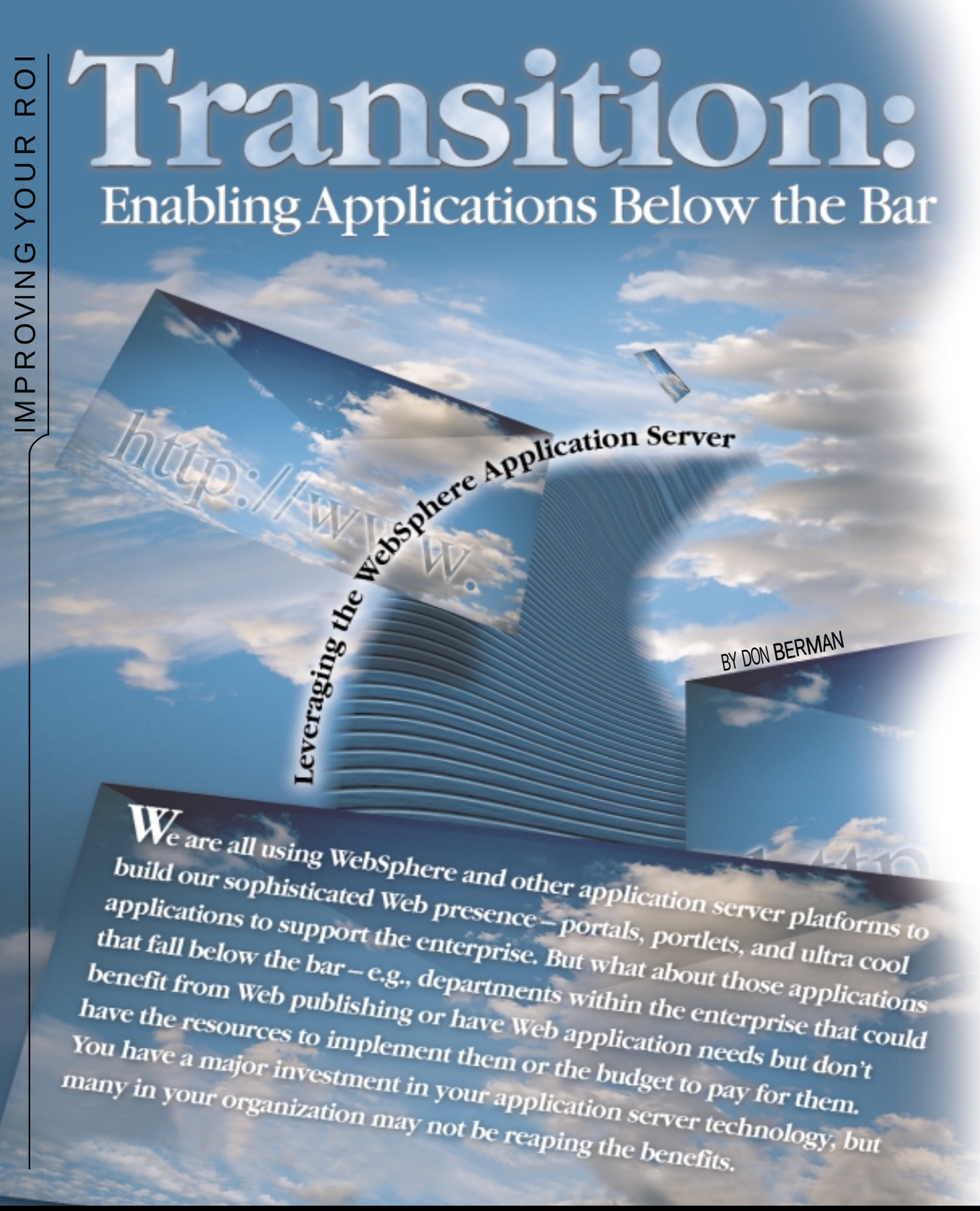
Reference

- Standish Group (1998). "CHAOS, A Recipe for Success."

CASE STUDY

Transition:

Enabling Applications Below the Bar



Consider the following examples:

- Meeting planners in the marketing department that farm out event registration sites to outside vendors
- Benefits administrators that are answering the same questions from employees over and over again.
- The human resources department spamming the organization with a plethora of e-mails about organizational and program announcements that go largely unread
- Divisions within your organization that have a lot of information to share, but not the budget to share it
- Departments within your organization with the need to collect information but that don't have the resources to develop the appropriate applications
- Organizations such as publishers, who need to create similar sites over and over again with limited funds
- Companies that want to control communication and interaction with vendors or suppliers but don't have the budget for the required applications

Wouldn't it be great if we could get additional return on our investment in an application server platform like WebSphere to benefit all within the walls of the enterprise? Well, fortunately, there are tools available that represent a trend to implement another layer between the application server platform and the user. The purpose of that layer is to move the power of application server technology closer to those who can benefit from it, by allowing users to more directly participate in the development of applications. Let's call these tools Web application enablers (WAEs). They are not intended to replace developers but merely to leverage them so that more can benefit from the power that the Web brings to business.

Web App Enablers – Benefits/ROI

The obvious benefit of end-user development is a dramatic decrease in development costs and a concomitant improvement in ROI. When delivered effectively, this concept radically changes the ROI model so that sites that previously were out of the question financially now become justifiable. Aside from development cost, a large component of the site cost of ownership is maintenance – particularly the maintenance of content. In order for sites to remain fresh, accurate, and timely, constant maintenance is required. An effective WAE will allow users to attend to this maintenance themselves. This not only empowers them – it also eliminates the costs associated with IT involvement in these recurrent, mundane tasks, while freeing technical resources for more mission-critical work.

Another potential benefit of WAEs is that they can provide the ability to enforce adherence to standards. Dollars spent on branding could be easily undermined by the proliferation of nonstandard or amateurish sites, even if they are only visible to suppliers and distributors. Once standards compliance is achieved, some of these tools allow standards such as style guides and look and feel to be changed easily across multiple sites.

Tools that enable Web application development fall into a wide range of categories and provide an equally wide range of functionality over a broad range of prices. For ease of discussion, let's divide WAEs into the following categories:

- Site-generation tools/templates
- ECM (Enterprise Content Management) solutions:
- Site development platforms

The goal here is not to evaluate the individual tools within these categories or even to judge the categories of tools themselves in some overall way. The aim is to look at these categories of tools and determine how they can provide aid to those users and applications that are below the bar In order to accomplish this, these categories will be evaluated at a high level as to:

- How ROI is affected by Web applications that are built
- How effective end users can be with these tools
- Whether these products are useful in providing adherence to standards
- Whether there is a positive impact on content management
- Whether implementation costs are high or low

The key to liberating those applications that are below the bar is the degree to which the tools and methodologies discussed will allow direct end-user involvement. I discuss them in the order in which they facilitate this end, starting with site-generation tools and moving through ECM to site-development platforms.

In the beginning, rudimentary site-generation tools made it easy to develop simple sites. Then our focus moved to managing content. Sites are still created by sophisticated and talented Web developers. Users focus on managing the content. With site-development platforms, the focus shifts back to the creation of the sites, but in a more sophisticated manner. Web developers' skills are leveraged across multiple sites by embedding the site rules and rendering instructions and standards into the site-development platform itself. Let's start from the beginning.

Site-Generation Tools/Templates

Tools in this category include Web templates provided by most Web authoring tools, e.g., MS FrontPage, Macromedia Dreamweaver, ISP scripts, Easy WebSites, et al.

These tools cover a broad range; however, the common feature that links them is that they generate HTML. Although this type of tool is not actually a layer between the application server and the user, it has potential to provide some of the same benefits (see Table 1). Many of the popular Web development tools supply this type of functionality as site templates to provide novice users with an easy way to develop sites. These templates provide a starting point for neophyte developers; as the developers gain experience, they depart from the templates, gradually negating their value.

QUICK SCOREBOARD	
Impact on ROI	Low
End-user Capability	Low
Promotes Adherence to Standards	Low
Impact on Content Management	Low
Cost of Implementation	Low

TABLE 1: SITE-GENERATION TOOLS

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ISPs, ASPs, and others involved in site hosting offer site-generation tools as a means of providing businesses with a low-cost Web presence by eliminating the cost of site development. These tools essentially fill in the blanks. A standard template is provided where the user simply provides text and pictures to create a custom version of the template or a custom site. Some of the tools are simply scripts that generate a standard set of HTML pages, while others can be more sophisticated, providing multiple templates for specific types of sites or pages and also allowing use of standard forms for capturing information from end users via questionnaires, registration forms, feedback forms, or surveys. In general, all of these tools provide only a starting point. Web development tools provide a great deal of functionality and flexibility. The more you take advantage of these features, the less value the templates provide. As with most software, ease of use – as in Web templates – falls easy prey to increased flexibility.

The impact of these tools on ROI tends to be minimal in all but the simplest scenarios. In the case where a site is needed without any modification to the standard pages, the impact on ROI is great. But as anyone who has dealt with business users can tell you, this is almost never the case. Typically, departure from the standard happens very quickly, negating the value of the script/template in terms of ROI or the ability to enforce standards. Once that happens, the potential for end-user development is also lost, since no HTML editor can be considered an end-user tool. This approach has virtually no positive impact on content management because moving content from a user's hard drive to a static HTML page does not represent a net improvement in content organization or accessibility. ECM tools in this category include Vignette, Interwoven, and MS Content Management Server.

QUICK SCOREBOARD	
Impact on ROI	Mid
End-user Capability	Mid
Promotes Adherence to Standards	Mid
Impact on Content Management	High
Cost of Implementation	High

TABLE 2: ENTERPRISE CONTENT MANAGEMENT

QUICK SCOREBOARD	
Impact on ROI	High
End-user Capability	High
Promotes Adherence to Standards	High
Impact on Content Management	Mid
Cost of Implementation	Low

TABLE 3: SITE-DEVELOPMENT PLATFORMS

ECM

Enterprise Content Management systems (see Table 2) are very powerful tools that have broad-range impact across the enterprise. On the development side, Web pages can be built from cataloged content that users define and maintain, and pages are served dynamically. Some of these tools allow content to be personalized based on user profile or behavior, browsing device, or even language preference. Workflow is a major component of many of these tools, establishing and enforcing complex rules regarding who can create specific content and maintain it, as well as tracking content changes and applying specific taxonomy to categorize content.

On the deployment side, the best of these tools can provide scalability, reliability, and extensibility, as well as load balancing and failover. Some serve content in XML, and enable XML-based Web services. All of these features promote the delivery of mission-critical Web applications.

But what about those applications that fall below the bar? Content management solutions could provide many benefits to users in terms of organization and accessibility of content, and many provide application-enabling tools to facilitate the delivery of this content via the Web, and promote adherence to standards. These tools vary in their complexity; but in general, for Web site creation they are the territory of content managers and Web developers, not end users. ECM has been portrayed as the latest in a long list of IT panaceas, but despite all of the hoopla we hear about these products, in reality a large percentage of valuable corporate information remains unsafely ensconced on PC hard drives.

Although content management solutions are a great idea, they are usually expensive and require a buy-in from many within an organization to be successful. This approach requires a lot of money, planning, political support, and time to bear fruit. The benefits to end users are typically at the end of what could be a multiyear process. Since the price range of these solutions varies greatly, the ability to get the ROI benefit described above will depend on the amount spent and the number of applications that expense can be spread across. In many cases, predicting an effective ROI model for ECM may require the aid of a crystal ball.

Site-Development Platforms

Tools in this category include SiteTelligence and Microsoft Web Author Client (see Table 3).

While Content Management solutions promote the automation and management of site content, a new category of solution – site development platforms (SDPs) – focuses on the automation and management of the site itself. Site development platforms enable users to quickly develop, deploy, and maintain their own Web sites with little or no IT involvement using WebSphere or other J2EE-compliant application server environments. These tools contain a set of applications that can render site content and forms dynamically from information stored in data sources created for this purpose. They provide a rendering engine that retrieves content and rendering instructions from a database and displays content for Web sites in a predefined standard manner dictated by a corporate style guide. The content gets into the database via development tools that walk users through a simple process to create and preview sites. Users basically cut and paste information from relevant documents to create sites. The user activity here is focused on the content as it relates to the site. Unlike ECM, there is no overarching effort or methodology focused on organizing or cataloging the content intrinsically. Users or administrators can deploy sites depending on corporate policy. After sites are deployed, users can come back at any time to update the content. They can also create forms for feedback, registration, questionnaires, or surveys. On the deployment side, these tools leverage application server technology such as WebSphere – already in place – to deliver highly reliable, scalable, fault-tolerant applications.

SDPs, in many cases, are not shrink-wrapped products, but rather a set of tools and processes delivered in conjunction with the required services to make the rendering engine capable of rendering the required sites.

These solutions allow for hidden data assets to be moved from PC hard drives to a centrally maintained repository, permitting access to content by others who might need it. While this is not content management per se, it can be regarded as a precursor to ECM. Getting the data off those hard drives and onto a database platform is an important first step and will make the work required to implement ECM down the road somewhat easier.

With that said, SDPs are not content management systems. They do not provide any of the content-focused functionality mentioned above. They are also far less costly and do not require users to buy expensive software or buy into complicated or arcane methodologies.

Since sites can be displayed by a single rendering engine, all sites will conform to the same style guide, forcing adherence to standards. This eliminates the need for the "style police" to enforce corporate style guides across the enterprise. This feature also makes changing style guides or the look and feel for multiple sites extremely simple. The content is in the database, but it's the rendering engine that implements the style guide. Therefore, to change multiple sites, all you need to do is modify the rendering engine, and all of the sites are effectively changed at once.

This solution is geared to a business need in which multiple sites are required to conform to a standard look and feel. In this case, the impact on ROI is great because end users can both develop sites and maintain content. The model becomes less compelling when used to develop individual sites. In those cases, while maintenance costs are still dramatically lower, the initial cost of the software and services to adapt the rendering engine is not diluted across multiple sites.

Conclusion

The tools compared in this article represent a very broad spectrum and may seem to be an odd group to put together; however, all of these tools provide potential to bring the power of the Web closer to end users – to enable those applications below the bar. Site-generation tools will only provide benefit in the simplest scenarios. ECM, however, is very powerful technology; and organizations that implement ECM effectively will no doubt reap benefits down the line. The challenge is to leverage not only the investment in software and services but also to justify the installation of personnel and procedures to support the requisite methodology. These factors make ECM an unlikely solution for below-the-bar applications, unless it is already ensconced in your organization. SDPs, while providing far less benefit in the content management area, seem directly aimed at enabling below-the-bar applications.

In order for organizations to take full advantage of sophisticated application server technology like WebSphere, it is critical that these tools accommodate the needs of end users without every business requirement becoming an IT development project with associated costs and complexity. Tools that utilize application server technology and benefit from its scalability, reliability, and performance – yet also enable users to create and maintain sites – will change the way organizations view the Web and Web development.

WebSphere DEVELOPER'S JOURNAL Coming Next Month...

TOOLS

Managing WebSphere Infrastructures and Applications

WAS

Exploring Container- Managed Relationships with WebSphere Application Server

MIGRATION

Fast Path to Data: Legacy Migration on Steroids

PRODUCT REVIEW

Visual XSP Studio from Trilog

IBM UNVEILS PORTAL PRODUCT FOR SMALL AND MID-SIZE BUSINESSES

(Somers, NY) – In the first of several software product introductions aimed at small- and medium-size businesses (SMBs), IBM has unveiled a new version of its portal software specifically designed for the SMB market. Designed in close consultation with its business partners, IBM says WebSphere Portal - Express is easy to install and use, and affordable to buy and maintain.

At just $77 per user, WebSphere Portal - Express comes embedded with the performance, standards-compliance, and reliability of IBM WebSphere Application Server. It also offers full support for portal personalization, campaign management, single sign-on across applications, authentication, authorization, and communication between portlets. And WebSphere Portal - Express can be run from just one server, ideal for smaller businesses that may not have many servers or a large IT staff.

WebSphere Portal – Express is ready for Web services. Its open architecture also provides customers with a host of choices. For instance, while WebSphere Portal - Express includes an LDAP directory, alternatives such as Microsoft Active Directory and Lotus Domino Directory are supported as options. WebSphere Portal - Express also offers a choice of databases.

WebSphere Portal - Express protects a customer's technology investments by growing as the company grows. For example, portlets used within WebSphere Portal - Express, which connect users to Internet-based information and company applications, are reusable across the entire WebSphere Portal family.
www.ibm.com

INTERWOVEN TO SUPPORT WEBSPHERE PORTAL - EXPRESS

(Sunnyvale, CA) – Interwoven, Inc., has announced TeamPortal for IBM WebSphere Portal - Express, to complement IBM's recently announced product. The offering will enable customers to quickly and easily get portal initiatives up and running, as well as provide the ongoing management of portal content, documents, and code.

According to Interwoven, TeamPortal is an affordable, scalable, and extensible solution that provides the necessary security, workflow, and versioning capabilities to ensure accuracy of all content, documents, and code, and to maximize the customer's portal investment. In addition, Interwoven solutions are built on Web services open standards, which speeds up implementation and supports future customization efforts.
www.interwoven.com

SIEBEL, IBM LAUNCH EUROPEAN CUSTOMER SUPPORT CENTER

(Los Angeles) – Siebel Systems, Inc., and IBM have announced the launch of a joint technology customer support center that showcases the latest Siebel e-business applications integrated to back-end business processes across multiple application integration scenarios on IBM server hardware and industry solutions. The European Customer Support Center utilizes facilities in Montpellier and La Gaude, France.

The center is the first demonstration center to support Siebel Systems' and IBM WebSphere Business Integration's solutions for Universal Application Network. Universal Application Network, the industry's first standards-based, vendor-independent application integration solution, was launched by Siebel Systems in April of this year. Universal Application Network takes a standards-based approach to the design and development of business processes based on best practices that are executed by integration servers. These business processes are application-independent and can be deployed across a diverse set of applications and across multiple divisions and business units.

The Universal Application Network architecture is demonstrated at the new center, running on IBM WebSphere's integration server technology. The combined solution will provide customers with a business process integration solution that connects their CRM solution with back-end legacy and ERP business processes while accelerating time to revenue and significantly reducing implementation costs, according to IBM.
www.siebel.com

ACTUATE OFFERS PORTLETS FOR WEBSPHERE PORTAL

(South San Francisco, CA) – Actuate Corporation, an information delivery specialist, has announced the development of a series of portlets that provide companies running WebSphere Portal with easier access to Actuate-managed content. Actuate has developed these portlets to enable its recently released Actuate 6 to better integrate with

REI Moves e-Business to WebSphere

(Seattle, WA) – Recreational Equipment, Inc. (REI), a national retailer of quality outdoor gear and clothing, has standardized its e-commerce applications with IBM's WebSphere platform, providing a faster and better-performing online store for REI.com's nationwide customers, the company has announced.

The move dramatically improves core shopping process times. It also sets a foundation for new features that will more closely integrate REI's sales channels, creating a seamless customer experience between stores and e-commerce.

REI plans to implement extensive new customer features utilizing the platform's capabilities in 2003. Customers can expect to find more personalized service and information, as well as more convenience and choice both online and in the stores as new features are rolled out.

The REI Web site offers a similar experience to that of visiting an REI store where trained staff provides personalized assistance in choosing outdoor gear. The site includes 45,000 pages of extensive product information, comparison charts, and "how-to" articles on everything from mountain biking to preparing for a backpacking trip.

Multiple kiosks with access to REI.com are installed in all of REI's 61 retail stores. Each provides in-store shoppers with the ability to research and order any of the outdoor retailer's 40,000 products and have them delivered to their homes or to their local stores.
www.rei.com

the standards-based WebSphere Portal. Actuate uses its information delivery capabilities to help enable the creation of the next generation of enterprise portals and e-business solutions.

Actuate's information delivery software is complementary to the portal infrastructure layer provided by WebSphere Portal. Actuate 6 enables organizations to manage structured information more easily on multiple sites and portals with a single application. By using the portlets to integrate Actuate and IBM software, customers can create, manage, and deliver content within the WebSphere Portal infrastructure.

The Actuate portlets enable IBM WebSphere Portal customers to more easily offer visitors relative, appropriate content. These Actuate portlets deliver ease of use for IT departments by offering tighter integration with IBM WebSphere Portal administration tools so IT users can install and configure them using the WebSphere administration interface.
www.actuate.com

RAPIDLY GROWING SYS-CON MEDIA GARNERS AWARDS

(Montvale, NJ) – SYS-CON Media has been named one of the fastest-growing 500 technology companies in North America by Deloitte & Touche in its 2002 Technology Fast 500. The announcement came one week after SYS-CON was named one of the nation's fastest-growing private companies by Inc 500 for the third time. The 2002 Technology Fast 500 listing will be available exclusively at Forbes.com in November.

SYS-CON Media is widely recognized in the i-technology and magazine publishing industries as the world's leading publisher of print magazines, electronic newsletters, and accompanying Web portals. The company has further solidified its dominant role in the i-technology space with the 2000 launch of an events business with trade shows, conferences, and education seminars.

SYS-CON Media achieved a record 752% growth in the past five years. The company's revenue and earnings have grown dramatically since its inception in 1994. From 1998 to 2001, revenue grew at a compounded annual growth rate of 72.9%. In 2003, the company projects its gross margin to increase 51.9%, and the contribution is projected to increase 70.4%, which will keep SYS-CON in an impressive growth pattern for 2002, 2003, and beyond.
www.sys-con.com

WILY TECHNOLOGY EXTENDS APPLICATION MANAGEMENT CAPABILITY

(Burlingame, CA) – Wily Technology, a specialist in enterprise Java application management, has announced that it has further extended its ability to monitor mainframe Java applications with the addition of Introscope PowerPack for IBM WebSphere for z/OS and OS/390.

Wily Technology is the only application management provider to offer comprehensive operations support for mainframe Java applications and application servers running in live production environments.

Wily's Introscope PowerPack for IBM WebSphere for z/OS and OS/390 combines Introscope's ability to monitor the performance of production J2EE components such as EJBs, JSPs, and servlets in real time with measurements specific to WebSphere. Developed in cooperation with the IBM WebSphere Development Team, Introscope PowerPack for IBM WebSphere for z/OS and OS/390 is preconfigured to offer instant component-level monitoring of WebSphere, including JDBC connection pools, HTTP sessions, and servlet threads, making it easier than ever for operations personnel to pinpoint Java application performance bottlenecks and to fine-tune their systems for optimal performance.

Introscope PowerPack for IBM WebSphere for z/OS and OS/390 is an extension of Introscope, Wily's comprehensive enterprise application management solution.
www.wilytech.com

PRECISE ANNOUNCES APPLICATION PERFORMANCE MANAGEMENT SOLUTION

(Westwood, MA) – Precise Software Solutions, the leader in optimizing customers' business through Application Performance Management, has announced the release of Precise i3 version 6.0. The product substantially enhances customer productivity by reducing application performance problem resolution time to a fraction of the norm, the company says.

Precise i3 version 6.0 combines Precise's in-depth data collection technology with its innovative TotalCorrelation and SmarTune technologies to solve a key business issue today – resolving application performance slowdowns before they damage business performance. The new product dramatically reduces problem resolution time to just minutes, compared to the 26-hour average time, according to Precise.
www.precise.com

Sybase Announces Availability of Enterprise Portal 5.0

(Dublin, CA) – Sybase, an enterprise infrastructure and integration company, has announced the general availability of its ready-to-deploy Sybase Enterprise Portal (EP) 5.0.

Packaged in three editions geared to deliver the best price/performance for each market segment, EP 5.0 helps lower total cost of ownership (TCO) of portal projects with support for multiple application servers, greater ease of use, increased security, and integrated development, deployment, management, and monitoring, according to the company.

By dramatically reducing the complexity of portal projects, EP 5.0 helps lower development, deployment, maintenance, and support costs. EP 5.0 Portal Studio allows users with little technical background to build even the most complex portlet, using a point-and-click interface with access to templates, catalogs, and all information sources, including Web, JSP, XML, HTML, and databases.

Portal Studio includes comprehensive workflow, versioning, and search and filter capabilities for easy maintenance. In addition, it simplifies deployment of portlets to multiple portals and allows multinational corporations to host several language pages in one instance of the software.

The resulting speed, reliability, and flexibility deliver substantial cost and time savings to EP customers, according to Sybase.
www.sybase.com

Speed Isn't Everything...

The importance of automating not just development, but maintenance too

BY JOHN CARON

Sports cars are typically measured by how fast they go from zero to sixty. But is that really the best measurement? Would a Honda Accord with a 500 hp V8 be a better sports car than a Porsche 911 Turbo? Obviously not. It takes a well-rounded vehicle to achieve this status – handling, braking, acceleration, reliability, etc. The same is true with development tools. Speed isn't everything. Agility is equally important. You need a well-rounded tool to create the best application.

Take portal development for example. Gene Phifer of Gartner has defined what he calls the "90/10–10/90 rule" for portal development. This rule states that in the initial phases of portal development, simple departmental portals, for example, 90% of the application's needs are met by out-of-the-box products – a very quick zero to sixty. But, as the applications evolve, they will leverage only 10% of this capability and will require 90% to be built as custom applications – requiring speed and agility.

Building J2EE-based applications, such as portals or custom portlets, is a difficult and iterative task. Rarely is an application built once and then never modified or updated. The average IT department spends 70%–80% of their time maintaining existing applications. There are lots of tools that can help you build applications quickly, from the out-of-the-box products with limited customization to code generators that make it easier to build and rebuild an application. But like the Accord with a V8 shoved under its hood, they only address part of the problem. You need to automate not only the development of these applications, but also their maintenance.

A portal can be an extremely powerful tool, provided it's presenting information that's relevant. Portals have an inherent need to change and adapt. One-size-fits-all portals give everybody some information, but nobody gets exactly the information they need. Portals need to change as the business evolves, and adapt to their surroundings.

If you're like most companies, you've moved beyond the simple departmental portal and are trying to provide an integrated view of your enterprise. This integrated view will be made up of a collection of custom portlets that need to adapt to their environment. No longer will you be able to create an application with a specific end user in mind. You've got to build applications that can serve all constituencies, and do it dynamically. How do you manage that kind of variability? It's relatively easy if you have 10 customers or partners. But what if there are 100 or 1,000 or even 100,000 that you need to support? How do you handle that level of customization?

You will need to make agility an element of the DNA of your portals – building them for change, not just for speed. You will achieve this by creating custom portlets, the pieces that will make up all of your portals, that can adapt dynamically and can be changed without the need for reprogramming through a centralized IT group. Using traditional out-of-the-box portlets, you would be required to push all changes through IT. With the need for customization increasing rapidly, this could create a serious traffic jam for your IT department. However, if you push out the customization of these portals and portlets to discrete business units, partners, or even the business users themselves, you can free your team of the costly burden of rewriting applications every time the business changes or you need a new iteration.

The complexities of J2EE development shouldn't outweigh the benefits of building great applications. But to date they have certainly stalled that effort. With the emergence of new tools that bring ease of development and maintenance to J2EE applications, your IT team will evolve from programmers who react to business change to application designers that anticipate change and put themselves, and your company, in the driver's seat.

ABOUT THE AUTHOR... John Caron, Bowstreet's director of market development, is responsible for developing the company's go-to-market strategies, corporate communications, and vertical segmentation. Prior to Bowstreet, John led the development of Art Technology Group's global marketing strategy, taking the company from a niche application server vendor to an industry leader. John's background also includes marketing and business development positions at Compuware and Borland.

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