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THE COMPLETE VISION OF SERVICE-ORIENTED
ENTERPRISE MANAGEMENT



THE COMPLETE VISION OF SERVICE-ORIENTED ENTERPRISE MANAGEMENT

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Abstract

Companies have long been striving to meet two critical goals in their enterprise: how to make their existing systems work better together, and how to gain critical visibility into how their various processes and systems are contributing to overall business goals. Into this arena, Service-Oriented Architectures and Web Services are introducing the concept of standards-based, loosely-coupled integration to help solve the first problem of managing intractable business integration problems.

At the same time, these approaches lend themselves particularly well to providing greater visibility into business processes and system performance. Traditionally, the areas of systems management, business management, and management of application interfaces have been separate technologies and problem domains. However, SOAs allow companies to pursue a unified approach towards managing their businesses and their systems in a more holistic fashion.

As such, this paper explores how companies can take a broader view of Web Services and system management and solve those problems using a well-crafted, service-oriented set of solutions. Finally, this paper introduces the reader to the Computer Associates' set of management products. In particular, Unicenter Web Services Distributed Management (WSDM), together with CA's infrastructure management products forms a comprehensive solution for managing Web services, businesses, services, and system assets to help businesses meet their ever-changing requirements.

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I. Management: Key to Enabling Business Agility

Change comes in many forms: in the marketplace, in technology, in the world at large. Companies that make effective use of a changing environment compete more effectively and thrive in any business climate. Such companies are particularly adept in tough economic times, often finding opportunities in the midst of chaos. However, technology is today's most important barrier to many companies' ability to respond to change, for two reasons. First, technology has become so intertwined with the business processes that changing a process often begins with changing the technology. Second, because technology is often expensive, difficult, and complex, technical issues often become the barrier that prevents companies from becoming *agile*.

To understand the challenges of business agility, one must first understand the complexity of today's IT environment. An IT organization consists of many different parts, each of which contributes equally towards the goals of helping IT meet business needs. Each of these parts have specific requirements for management as detailed below:

Because technology is often expensive, difficult, and complex, technical issues often become the barrier that prevents companies from becoming agile.

- *Systems and Networks* – At the core of all IT organizations are the physical systems and networks that run the day-to-day operations of the business. These systems include the hardware (such as servers, storage, desktop applications, client devices, phone systems) as well as the networks that interconnect them. Management of systems and networks entail making sure that these systems and networks are constantly running and are optimally performing their tasks.
- *Applications* – On top of the systems are the software and applications that provide the business logic to perform the tasks a business requires. Some applications are purchased from third parties while others are built in-house. Regardless of their origin, all of these applications need to be managed so that they are accurately meeting their requirements.
- *Information* – The life-blood of the enterprise is the data and information that flows in the applications and through the systems and networks. Information includes the data necessary for operations as well as the metadata that describes the context for that information and the storage requirements for moving and persisting data. Managing information thus requires the management of data, metadata, and the movement and storage of data.
- *Services* – An IT department would just be a collection of components if it weren't for the various architectural approaches that tie them together into a cohesive organization. Architectural elements tie together applications, information, systems, and processes, and support IT requirements for tight or loose coupling, coarse or fine granularity, and synchronous or asynchronous modes of interaction. As described in detail below, Service-Oriented Architectures require management capabilities of their own in order to guarantee the benefits they promise.
- *Processes* – Spanning systems, services, and applications are the processes that guide how a company operates and interacts with external third-parties. These processes, which are separate from the underlying systems and services, must be managed as well so that companies can guarantee that their business operations are running as needed.

Companies must manage all IT aspects in a cohesive, comprehensive manner in order to give organizations a complete view of how IT is responding to business drivers.

Therefore, anyone that hopes to address the issues of IT in a comprehensive fashion, must encapsulate meet the requirements of managing all the parts of the IT ecosystem mentioned above. But management of each of the above parts of the IT environment in a discrete fashion is not good enough – rather, companies must manage all those aspects in a cohesive, comprehensive manner in order to give organizations a complete view of how IT is responding to business requirements.

However, this challenge of IT management is made more complicated since business requirements are constantly in flux due to the natural changes that an organization experiences. As a result, the comprehensive management of IT systems must also happen in a real-time, or more accurately, a “right-time” fashion. This means that as new business requirements emerge, the underlying business processes, services, information, applications, and systems must be able to respond to those changes. Likewise, the business must be able to monitor and manage any changes in any part of the IT ecosystem as they occur. Sometimes, the business must respond to changes right away, as the changes happen – in real-time. In other instances, the business can afford to wait until the time is right to react and respond to business or underlying infrastructure changes. And the most forward thinking and agile of businesses use comprehensive IT management solutions as a way to understand and predict overall behavior before any changes are introduced into processes, applications, or systems.

Meeting the Requirements of Business Agility

Yet management of discrete IT functions is not sufficient to meet the most pressing and critical of business drivers today – the need for *business agility*. Business agility is the ability for businesses to proactively manage change and use changing business environments to their advantage. Of all the technology issues facing companies today, the one that is most likely to be a bottleneck is *integration*. The apparently simple act of getting two or more different systems to talk to each other—in a flexible, easily changeable way—has been a surprisingly persistent problem since the advent of distributed computing decades ago. Simplifying integration so that it is more cost-effective and flexible will go a long way to remove the technology bottleneck facing so many companies, and therefore, efficient integration is the key technology driver facing enterprises today.

Yet, while companies have attempted to solve their integration problems for decades, their integration problems continue to persist. At one level, the cause of these integration problems is the lack of standard ways of programming different systems to communicate. For any two different systems, the traditional approach to integration is to write programming code for each system that is specifically written to talk to the other system. Such an approach is expensive and time consuming, and doesn’t scale well or respond to change in a flexible way. This

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In order to realize the vision of a truly loosely-coupled integration architecture, there must exist some intermediary between a Service requester and Service provider that actively manages and brokers Service requests.

approach to integration is *tightly coupled*, which means that one programming team must control the integration code on both systems to get them to communicate with each other. Such integration is also point-to-point, which means that the complexity of the distributed systems explodes as the number of systems goes up.

What companies need to solve these integration cost and complexity issues is a *loosely coupled* approach to computing—one that does not require control of systems on both ends. However, for loose coupling to be a reality, two key requirements must be met. First, loosely coupled solutions should be based on standard, established ways of handling integration so that any company that follows the standards can be confident that their systems will interoperate with the other systems the company wishes to communicate. This standards-based approach to loosely coupled integration is what the promise of Web Services are all about. Second, in order to realize the vision of a truly loosely-coupled integration architecture, there must exist some intermediary between a Service requester and Service provider that actively manages and brokers the requests so that any implementation from one side of the interaction is isolated from the other. This is precisely the goal of a new class of comprehensive management solutions.

II. Managing Web Services and Service-Oriented Architectures

As described earlier, the primary need of businesses is managing their changing business requirements. Loosely coupled, standards-based Service-oriented architectures (SOAs) are an approach to distributed computing that thinks of software resources as Services available on the network. Consumers of these Services (which are the systems that wish to integrate with the Services) can find and connect to the desired Services in a loosely coupled fashion. Ideally, the Services available on the network expose the functionality of the underlying software in terms of business concepts.

Web Services are an open standards-based way of creating and offering SOAs. SOAs implemented with Web Services are a significant improvement over previous attempts at loosely coupled integration for several reasons:

- Web Services are based on open standards that most software vendors agree upon, and, therefore, it's possible to get software that interoperates out of the box.
- Web Services are designed to promote loosely coupled communications between Web Service producers and consumers. Such loose coupling means that producers and consumers can be developed independently of each other.
- Web Services are able to exchange structured documents that contain different amounts of information, as well as information about that information, known as metadata. In other words, Web Services can be *coarse grained*. Such coarse granularity is one of the most important features of SOAs.

SOAs, however, offer more than just technical advantages over other approaches to distributed computing. Fundamentally, SOAs offer a different perspective on the way that an organization accesses its IT capabilities. To reap the full benefit of their Web Services implementations, and to build IT environments that are flexible and responsive, companies must understand this new perspective.

In general, SOAs offer the following five advantages over traditional approaches to distributed computing:

- They offer coarse-grained business Services, as opposed to fine-grained software-oriented function calls.
- They provide location independence: Services need not be associated with a particular system on a particular network.
- The underlying systems are loosely coupled from the Service consumers.
- Authentication and authorization of Service consumers, and in general all security functionality that applies to the Services, can also be provided via Web Services interfaces rather than tightly-coupled mechanisms.
- Web Services consumers can find and connect to available Services dynamically.

In addition, Service-Oriented Architectures based on Web Services leverage two key software concepts: encapsulation and composition. A software object is encapsulated when its inner workings are hidden from view. Furthermore, encapsulated objects are defined by their functionality. Encapsulation is important because it breaks up large software projects into tasks that can be assigned to different developers. If the development team agrees on the object interfaces, then the team can work in parallel.

Composition is a concept related to encapsulation that finds its roots in virtualization. Virtualization is a software design approach that provides an abstraction layer between the user and the software. In the case of Web Services, this abstraction layer is Service orientation. At its most basic, the rearchitecture process for creating an SOA involves encapsulating software components, applications, and underlying systems with Web Services interfaces and then composing (virtualizing) these fine-grained functional Web Services into coarse-grained business Services.

Companies that successfully rearchitect their IT infrastructures to take advantage of Service-oriented architectures are able to remove the integration bottleneck, and connect different systems in a flexible, cost-effective manner. With the integration bottleneck removed, then, such companies are able to achieve their desired business agility. The true goal of implementing Service-oriented architectures, therefore, is to remove the bottleneck that IT has on businesses' ability to be agile.

Enterprise-class Service-oriented architectures require Service-oriented management.

In order to realize the benefits of SOAs, companies must transition their systems from the existing architectures to SOAs in a manner that does not impede the ongoing necessary functionality of the technology. Furthermore, the act of rearchitecting is not sufficient enough by itself to guarantee that the resulting business Services will meet the needs of the business. The enterprise also must have a management infrastructure in place that can support the monitoring of Services performance as they are being moved into production as well as once they are available for public consumption.

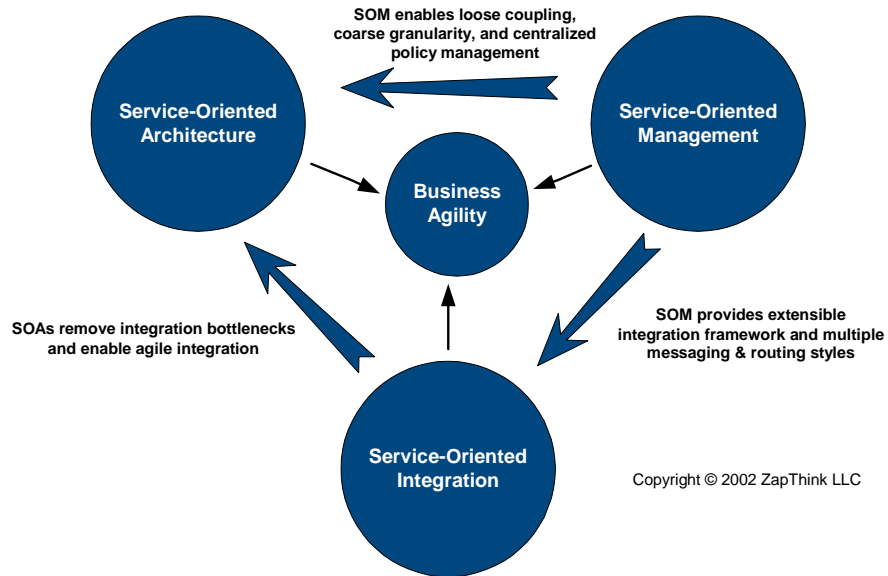
Finally, in order to encapsulate the underlying software components and systems with Web Services interfaces and then compose these fine-grained atomic Web Services into coarse-grained business Services, companies must have a set of management tools that can establish and maintain the connections between the

The true goal of implementing Service-oriented architectures is to remove the bottleneck that IT has on businesses' ability to be agile.

The enterprise must have a management infrastructure in place that can support the monitoring of Services performance as they are put into production.

software on the one hand and the Services on the other. Service-oriented management is this management infrastructure that companies need to support the ongoing functionality of a SOA. The relationships between SOA, integration, and Service-Oriented Management and how they contribute to business agility are shown in the below figure:

Figure 1: Relationships between SOA, Management, and Integration



As can be gleaned from the above diagram, the main concepts of Service-orientation – Service-oriented integration, architectures, and management – are neatly combined in a way that contributes to business agility. In fact, the entire Web Services movement is about business agility, when reduced to its most fundamental purpose. For too long, technology has been the limiting factor for business, and as a result, technology and its limitations have been driving business decisions. If companies can make the difficult transition to Service orientation, then finally, business needs will be able to drive technology decisions instead.

III. Implementing a Solution for Broad Web Services Management

Web Services management solutions help companies manage the systems and applications that underlie their Web Services implementations.

Web Services management solutions help companies manage the systems and applications that underlie their Web Services implementations. More importantly, many of these products provide the critical infrastructure necessary for companies to ensure the loose coupling and coarse-granularity that comprise a Service-Oriented Architecture. Such products are what ZapThink calls Service-Oriented Management solutions.

In today's IT environment, IT management is tightly coupled to the systems being managed. System management products provide visibility and control into the various systems that make up an enterprise's IT infrastructure. In an SOA, however, what is most important are the Services being exposed, and not the systems *per se*. It is still just as important to manage the systems that underlie the Services, but even more important is the ability to manage how the systems enable business Services to function as they should—in a location independent, coarse-grained fashion. Web Services Management solutions bridge the gap,

Bridging the gap between systems and Services is logically more complex than simply managing the underlying systems.

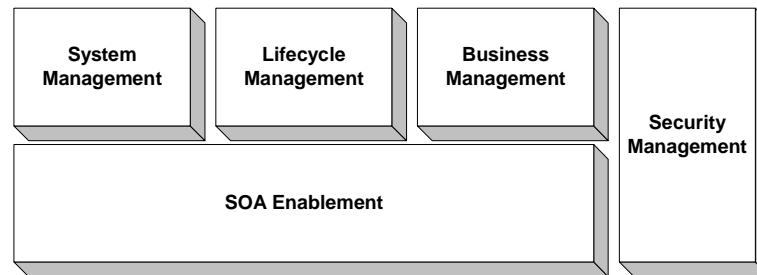
All Web Services management platforms must begin with system management.

therefore, between the underlying systems and the Services that run on top of them.

The five categories of Web Services management functionality

Bridging the gap between systems and Services is logically more complex than simply managing the underlying systems. As a result, Web Services Management solutions provide a range of functionality for managing SOAs and the Web Services they contain. These features fall into five general categories: system management, lifecycle management, business management, security management and SOA enablement, as shown in the figure below.

Figure 2: The Five Categories of Web Services Management Functionality



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Web Services-enabled System Management

The first category of management that Web Services management must address is system management. Since Web Services run on software that in turn runs on systems, all Web Services management platforms must begin with system management. The functions that fall into the system management category include:

- *Monitoring* – insuring that underlying systems are up and running.
- *Alerts* – notifying the appropriate people or other systems when there’s a problem with a system.
- *Auditing & reporting* – tracking the usage of Web Services and making that information available to reporting systems.
- *Service-level agreement (SLA) and quality of service (QoS) management* – tracking the quality of service offered to particular customers (uptime, latency, etc.) and adjusting various performance criteria to insure that each customer is getting the service they contracted for.
- *Exception management* – handling problems that occur by following policies set out for dealing with such problems.
- *Root cause analysis* – digging down through various layers of system functionality (Web Service, application, application server, network, operating system, hardware) to find the actual cause of particular problems.

Lifecycle Management

In addition to making sure the underlying systems are working properly, Web Services management platforms often handle the process for putting new Web Services into production, and dealing with them when they change. The functions fall into the lifecycle management category and include:

- *Provisioning* – putting new Web Services into production and helping Web Service consumers access them properly.
- *Versioning of Web Services* – managing different versions of Web Services that may be in production at the same time.
- *Deprecation* – retiring out-of-date Web Services gracefully, without breaking any Web Service consumers that may be accessing them.
- *Dependencies* – handling changing Web Services when one Web Service may depend on another.
- *Configuration management* – managing different configurations of one or more Web Services as companies upgrade or change the Services.
- *Web Service emulation* – simulating sets of Web Services for the purposes of testing.

Business Management

IT administrators are typically in charge of the system and lifecycle management functionality of a Web Service management platform. However, several platforms also provide visibility and control for the line of business manager. These managers are concerned with the following functions, which fall into the business management category:

- *Collaboration management* – Enabling the business manager to understand and manage how people are using Web Services.
- *Business process management* – managing the business processes that are enabled by Web Services.
- *Decision support* – accessing the critical business information in an IT infrastructure needed to make business decisions.
- *Transaction management* – monitoring and controlling the business transactions that go through Web Services.
- *Message prioritization* – controlling which customers get access to particular Web Services, especially when those Services are not able to serve all customers equally.
- *Business activity monitoring* – monitoring additional business-related activities taking place on the IT infrastructure.
- *Billing & metering* – determining use of particular Web Services and feeding that information to a metering, usage control, and/or billing systems.
- *Revenue management* – monitoring the flow of revenue through the managed Web Services.

Security Management

Overlapping the area of Web Services management is the Web Services security segment of the market. In many ways, security is a category in its own right (which is why they are off to the side in the above diagram), but many Web Services management products also manage Web Services security. The sorts of functions that such products manage include:

- *Authentication and access control* – making sure that only authorized Web Services consumers can access individual Services.

Service-Oriented Management solutions provide the critical connection between coarse grained business services and the systems and applications that support them.

- *Confidentiality* – Encrypting messages to make them more secure. May also involve decrypting incoming messages to inspect them and then reencrypting them.
- *Malicious attack protection* – preventing unauthorized access to Web Services, including those that are actively seeking to penetrate the Services.
- *Non-repudiation* – providing an audit trail for incoming or outgoing messages to guarantee their delivery.

Service-Oriented Architecture Enablement

Putting all the system, lifecycle, business and security management functionality together offers a broad range of management capabilities to the enterprise, but still do not provide the critical connection between coarse grained business services and the systems and applications that support them. Web Services management platforms must also provide a set of functions we call SOA enablement. Platforms that provide SOA enablement capabilities help companies take collections of fine-grained Web Services and roll them up into coarse-grained Business services, or help in the provisioning of Web Services of various levels of granularity from non-Web Services application functionality. The functions that fall into the SOA enablement category include:

- *Caching/virtual Web Service* – creating instances of Web Services that serve as fully functional copies of those Services. Should the original service become unavailable, the cached copy can serve automatically.
- *Synchronous/asynchronous conversion* – if an underlying system is unable to respond to a Web Services request in real time, the management platform can respond with an automatic “your request is being processed” message, and then send the desired result when it is ready.
- *Orchestration and Choreography* – Taking individual, fine-grained Web Services (typically wrappers for existing applications) and combining them into coarse-grained business Services.
- *Web Service instance management* – preserving the location independence properties of a SOA by enabling different systems in different locations to provide particular Web Services.
- *Dynamic routing* – sending Web Service consumers’ requests to different systems depending on availability, also to preserve location independence and improve overall system performance.
- *Protocol translation* – Translation between different protocol and messaging formats including SOAP, Java messaging, message-oriented middleware like IBM WebSphere MQ (MQSeries), DCOM, and others so that systems that are not exposed as Web Services can participate fully in the SOA.

While Service-oriented management applications offer different combinations of these features, they must all offer encapsulation and composition of Web Services -- because encapsulation and composition are necessary to enable an SOA, and the SOA is the key to business agility.

Broadening the Scope of Web Services Management

Yet, as we explained earlier, Service-Oriented Architectures represent just one part of the total IT ecosystem that must be managed in order to provide broad-based business benefit. In order to get the full benefit of Web Services Management, we must also extend our Service-Oriented Management solution to cover the rest of the heterogeneous IT ecosystem, from systems to processes.

At the lowest levels of the IT infrastructure are the systems and networks on top of which Services-enabled applications run. Even at this layer, Web Services can help bring cohesive management to the enterprise. Most IT environments have a heterogeneous array of systems, each of which must be managed, but each of which have different management interfaces and capabilities. Web Services can help smooth the differences between the management interfaces and thus allow the disparate, heterogeneous array of systems be managed in a cohesive way. Web Services-based standards, such as the Web Services Distributed Management (WSDM), are currently in progress of being created to solve these cross-platform management issues.

Furthermore, it is important to note that Web Services themselves are just interfaces to functionality that runs on systems. If a system goes down or otherwise becomes unavailable, the Service will also become unavailable. As such, a robust management system must need to handle not just the management of the Service interfaces or the systems in isolation, but also the connections and dependencies between the two different parts of the IT ecosystem.

In addition to managing the underlying systems, applications, and Services, comprehensive management solutions should also handle the management of long-lived, cross-organizational business processes. Service-Oriented Management is relevant to management of business processes for two reasons: processes consume services as activities, and processes themselves are represented as services. In the first case, any business process application must contain Service-Oriented Management features as a part of its solution in order to isolate the process definition from service-level changes. However, the second case requires the management of an end-to-end process that is composed of subprocesses and services, and these needs require additional capabilities from SOM solutions.

Businesses must have more flexible control over their businesses process, with end-to-end visibility and the capability to control specific steps in the process. A robust management infrastructure must both monitor the health of the environment, as well as provide the capability to optimize and adapt itself in right-time. Finally, business processes must be able to meet business requirements, and as such, management tools must be able to provide a “business dashboard” that manages the execution of processes from a business requirements perspective. Process management systems therefore need to provide real-time access to critical business information, potentially drawn from multiple application systems and sources, and use business events to report on the progress of individual processes. In addition, the need to establish business metrics for process execution requires the setting of process “policies” and the management and monitoring of processes to see if they meet those policies.

Together, all these aspects of enterprise IT management combine to create a complete architecture for implementing an agile architecture capable of meeting ever-changing business requirements, integration needs, and IT capabilities.

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IV. The Computer Associates Unicenter WSDM Solution

Computer Associates (CA) has been solving enterprise IT management challenges for decades.

Unicenter WSDM is CA's solution for managing Web Services-based SOAs in a manner that allows users to produce loosely coupled, coarse-grained services that can efficiently meet business needs.

Computer Associates (CA) has been solving enterprise IT management challenges for decades. As CA continued to advance its Web Services and systems management objectives, they realized that they needed to approach enterprise IT management in a more comprehensive manner. To meet those requirements, the company developed its Unicenter Web Services Distributed Management (WSDM) solution. Unicenter WSDM is CA's new solution for managing Web Services-based SOAs in a manner that allows users to produce loosely coupled, coarse-grained services that can rapidly respond to service interruptions and efficiently track business performance.

Unicenter Web Services Distributed Management (Unicenter WSDM) is based on a manager/observer architecture. The observer is a management intermediary that can be deployed as a native process (agent) or as a stand-alone proxy. The observer listens for each deployed Web service transaction, and then monitors and reports on that service. The observer samples data via SOAP, WSDL and XML, and provides critical Web Services-enabled Systems Management capability by reporting on a wide range of pre-set parameters, from message size and volume to response time and fault occurrences. The result is that Unicenter WSDM can make, real-time, in band observation of Service interactions.

Unicenter WSDM managers provide Business Management features by aggregating data from the observers, and automatically setting alerting thresholds. This capability ensures IT's ability to proactively respond to Service and underlying systems issues before they result in service disruptions. In addition, Unicenter WSDM supports both J2EE and .NET environments, allowing for the broadest possible reach of Services in the IT environment.

Often users and data center administrators do not know how many Services they have running in their environment, and even if they do have visibility into their running Services, they do not know the thresholds that should be used for monitoring and alerting. As a result, the Unicenter WSDM solution can provide critical SOA enablement and Lifecycle Management features that automatically discover running Services and generate critical performance thresholds and service level agreements for ongoing successful running of the Services. The system can detect problems and service failures, and take corrective actions if they occur. Finally, the product can also control Service consumer activity by dynamically changing and rerouting transactions when needed.

In support of its management capabilities, Computer Associates is also a leader in promoting the use of open, community agreed-upon standards for Web Services and Service-oriented Management. Naturally, Unicenter WSDM supports the core Web Services specifications (SOAP, WSDL, UDDI) as well as full support for management standards such as SNMP and Web-based Enterprise Management (WBEM). CA is also driving the OASIS Web Services Distributed Management (WSDM) standard and will be among the first to support it and other standards developed by the committee, once they are finalized.

In addition to managing the Service interfaces, Computer Associates has robust support for managing the runtime J2EE environments through its Unicenter Management for IBM WebSphere and Unicenter Management for BEA WebLogic products. These products provide extensive monitoring and management of end-to-end J2EE web application infrastructure, ensuring the health of J2EE application servers and EJB-based applications. Also, these solutions watch and manage web transactions from web servers through the application server to databases and back in real-time, with the ability to drill down and visualize detailed behavior of any application component throughout the chain. CA calls this the "Insider" view of an application that helps to quickly locate and resolve

CA's solution goes deeper in its support for enterprise IT management requirements than emerging start-up vendors, and broader in its support for runtime platforms than other enterprise management vendors

A comprehensive approach to management that treats each part of the IT ecosystem as important players in a cohesive organization will give businesses the agility it needs to meet changing business requirements.

the root-cause of performance bottlenecks or performance degradations, increasing overall application up-time. In addition to monitoring capabilities, these products also provide rich support for business-level Service compliance through testing of the underlying business logic, and validating the data produced by EJB applications.

Finally, the system reduces overall administration costs by utilizing intelligence, automation, and wizard-driven technologies to reduce resource-intensive monitoring and manual systems management. The J2EE application server management products provide a robust auto discovery process of running business logic combined with clear visualization. In addition, the product provides administrative controls, predefined thresholds and automatic alerts, to help guarantee the continuous operation of business logic and ensure accurate content and acceptable response times.

Computer Associates, through its Unicenter WSDM release and robust support for management of J2EE runtime environments, shows that it plans to focus mainly on the five categories of Service-Oriented Management of Web Services, rather than trying to provide the underlying platforms for Service execution and integration. Instead, the company plans to partner with others to provide the development and integration capabilities that many of its competitors hope to provide in competition with their own partners. CA's solution goes deeper in its support for enterprise IT management requirements than emerging start-up vendors, and broader in its support for .NET, J2EE and other runtime platforms than other large, enterprise management vendors, and in doing so, hopes to emerge as the market leader for comprehensive, enterprise IT management.

V. Conclusions

Today's approaches to computing IT implementation do not equip IT to respond swiftly to either changing business requirements or the risks that develop from unknown or changing circumstances. Furthermore, the IT organization finds themselves continuously scrambling to catch up with the challenges posed by an ever-increasing array of heterogeneous systems that must be connected together in a cohesive manner. As a result, companies often constrain the expectations of the business, essentially allowing technological risks and limitations to drive the business.

Web Services-based SOAs reverse this predicament, providing sufficient flexibility to allow business to drive the technology. Yet, simply having a development approach to building and connecting IT functionality is not sufficient to provide the business the flexibility it needs to continuously make decisions that change the requirements for their underlying IT systems. Rather, a comprehensive approach to management that treats each part of the IT ecosystem – the systems, networks, applications, Services, and processes – as individual and important players in a cohesive organization will give businesses the visibility and ability to change any part of their ecosystem at will to meet changing business requirements.

When business truly drives the technology, IT is finally able to support flexible business processes, enabling an enterprise to evolve to an agile business. Comprehensive, enterprise IT management solutions, such as those provided by Computer Associate's Unicenter WSDM solution, fill this evolving need in the enterprise and can help companies realize their vision of the agile business.

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ZapThink is an IT market intelligence firm that provides trusted advice and critical insight into XML, Web Services, and Service Orientation. We provide our target audience of IT vendors, service providers and end-users a clear roadmap for standards-based, loosely coupled distributed computing – a vision of IT meeting the needs of the agile business.

ZapThink's role is to help companies understand these IT products and services in the context of SOAs and the vision of Service Orientation. ZapThink provides market intelligence to IT vendors who offer XML and Web Services-based products to help them understand their competitive landscape and how to communicate their value proposition to their customers within the context of Service Orientation, and lay out their product roadmaps for the coming wave of Service Orientation. ZapThink also provides implementation intelligence to IT users who are seeking guidance and clarity into how to assemble the available products and services into a coherent roadmap to Service Orientation. Finally, ZapThink provides demand intelligence to IT vendors and service providers who must understand the needs of IT users as they follow the roadmap to Service Orientation.

ZapThink's senior analysts are widely regarded as the "go to analysts" for XML, Web Services, and SOAs by vendors, end-users, and the press. They are in great demand as speakers, and have presented at conferences and industry events around the world. They are among the most quoted industry analysts in the IT industry.

ZapThink was founded in October 2000 and is headquartered in Waltham, Massachusetts. Its customers include Global 1000 firms, public sector organizations around the world, and many emerging businesses. ZapThink Analysts have years of experience in IT as well as research and analysis. Its analysts have previously been with such firms as IDC and ChannelWave, and have sat on the working group committees for standards bodies such as RosettaNet, UDDI, CPExchange, ebXML, EIDX, and CompTIA.

Call, email, or visit the ZapThink Web site to learn more about how ZapThink can help you to better understand how XML and Web Services impact your business or organization.

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