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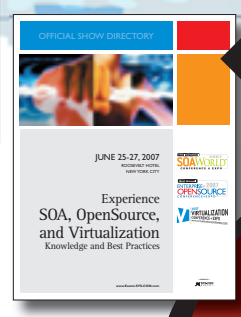

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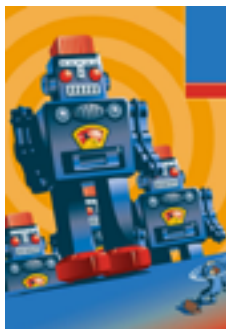
The Rise of the Machine

WRITTEN BY **SEAN RHODY**

Many recent science fiction novels deal with the concept of nanites – tiny bits of computers than can aggregate themselves to form new larger composites to assist their host. These concepts typically relate to making human cells self-healing, but they also have their sinister aspects, like the terminator, made out of liquid living metal in the last movie, who could reconfigure himself at will into any shape, and recover from any injury.



While this may seem like fantasy at the moment, there's a quiet revolution going on in the computing industry that makes this dream (or nightmare) one step closer to reality. Oddly enough, it's all a part of service-oriented architecture.

The underpinnings of any SOA are based on a service-oriented infrastructure, which basically creates callable, configurable services out of the lower-level components that make up an application infrastructure. Many of these services are familiar as system services – single sign-on, auditing, security management, reporting, etc. But what is fascinating in this world is the change that is taking place in the guts of the hardware.

Space in a data center is always at a premium, as is computing power. The natural tendency to try to pack more computing into the same space has been taken to its extreme conclusion with recent advances. Multi-core chips put two, four, or even more CPUs in the space previously occupied by a single CPU. Processing power is exploding like never before, and with cheaper memory and disk costs, the machines of today under the average user's desktop pack more processing power and capacity than many supercomputers of the previous decade.

All this would be trivial, except that with this rise we've also seen some very interesting services developed along with the silicon. Virtualization is a key part of the new wave of computing. With the ability to share resources down to as little as a 1/10th of a CPU, virtualization provides an amazing degree of flexibility.

Many developers and project leaders will tell you that the infrastructure costs for disaster recovery and testing are prohibitive. It is frequently impossible to fully fund multiple environments to support such requirements. With the advent of virtualization, the DR environment can be the testing environment under normal conditions, and then, at a time of emergency (or even just a request for increased capacity), can reconfigure itself quickly, ratcheting back or eliminating testing completely to become a full production environment, much like our terminator changing from one form to another.

The key to all of this is a service-based approach that allows for definitions of environments to be modified in response to changing environmental conditions. Theoretically no human intervention is even necessary – fail over at the router or load balancer will trigger a service call that can make the transition happen automatically. Similarly, with the return to service of a primary site, the fail back of the environments can reconfigure the disaster recovery site back to a testing environment.

Nor is this a binary condition – testing comes in different flavors and it's easy to imagine having multiple virtual environments to switch to – some with additional horsepower to support performance testing, others with less capacity to support functional testing instead. With automated testing tools, this can even take place in the complete absence of human intervention. At night the machines run themselves; in the morning, the humans analyze the results and plan the next evening's run.

Hundreds of other possibilities exist, from automating existing processing assignments, to reconfiguring networks, to adding additional disk capacity from a farm, the ability to morph and change the infrastructure is increasing rapidly.

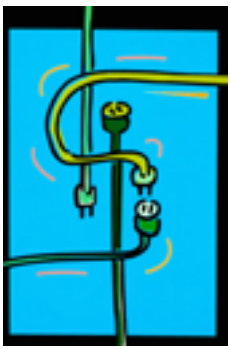
Fortunately we're a long way away from sentient machines, and time travel still appears to be a fantasy with no real hope of ever happening. But the rise of SOA is certainly upon us. ■

About the Author

Sean Rhody is the editor-in-chief of **SOA World Magazine**. *He is a respected industry expert and a consultant with a leading consulting services company.* *sean@sys-con.com*

SOA, On-Demand, Becoming a Reality

WRITTEN BY **DAVID S. LINTHICUM**



If you've kept up with SaaS and SOA you know that Salesforce.com does an on-demand SOA solution. Apex is its on-demand development and deployment platform, including a complete development environment, programming language, database, and now the ability to create, expose, and consume Web Services.

Its on-demand platform has been evolving for some time, and now it's moving into the SOA space with an offering that's both disruptive and innovative. I'm not sure too many out there saw SOA on-demand coming, but if anybody can pull it off, Salesforce.com can.

From its press release:

"Salesforce SOA will provide the ability to mashup salesforce.com's multi-tenant on-demand service with enterprise workflow and business processes to enable new kinds of enterprise applications on-demand. As a new capability of the Apex programming language, Salesforce SOA will enable SOA-based business processes, such as enterprise applications, to be created, maintained, and leveraged on-demand. SOA business processes will become virtual and sharable, and benefit from the scalability and agility of the on-demand model."

The multi-tenant Salesforce platform provides a feature set for building business applications such as models and objects to manage data, a workflow engine for managing collaboration between users, a user interface model to handle forms and other interactions, the Salesforce API for programmatic access, mashups, and integration with other applications and data, and the Apex programming language.

This is the first of many steps that Salesforce.com will take to drive its on-demand platform further into the market. It just makes logical sense when you consider that it's a huge service provider, and the companies are leveraging Salesforce.com for their business processes delivered through a subscription-based service. Now, you can take those processes and services and bind them to processes and services inside your enterprise, between your customers and partners, and do so using a SOA infrastructure that you also leverage using a subscription service. It's also an application development platform, letting you create and integrate your own on-demand business applications.

Those who leverage "Salesforce SOA" now will include current Salesforce.com subscribers that need to integrate their internal processes and services with Salesforce.com and build new business processes and new application functionality as well. They will find this approach more cost-effective.

As the Salesforce.com SOA stack gets more mature and better known, Salesforce.com may find that Salesforce SOA users, many of whom are not current Salesforce.com subscribers, will be leveraging Salesforce SOA as an inexpensive way to get into the world of

—continued on page 11

About the Author

David S. Linthicum is an internationally known application integration and Service Oriented Architecture expert. In his career Dave has assisted in the formation of many of the ideas behind modern distributed computing including Enterprise Application Integration, B2B Application Integration, and Service Oriented Architecture, approaches and technologies in wide use today. Currently, he is CEO of the Linthicum Group, LLC, (www.linthicumgroup.com) a consulting organization dedicated to excellence in Service Oriented Architecture planning, implementation, and strategy.

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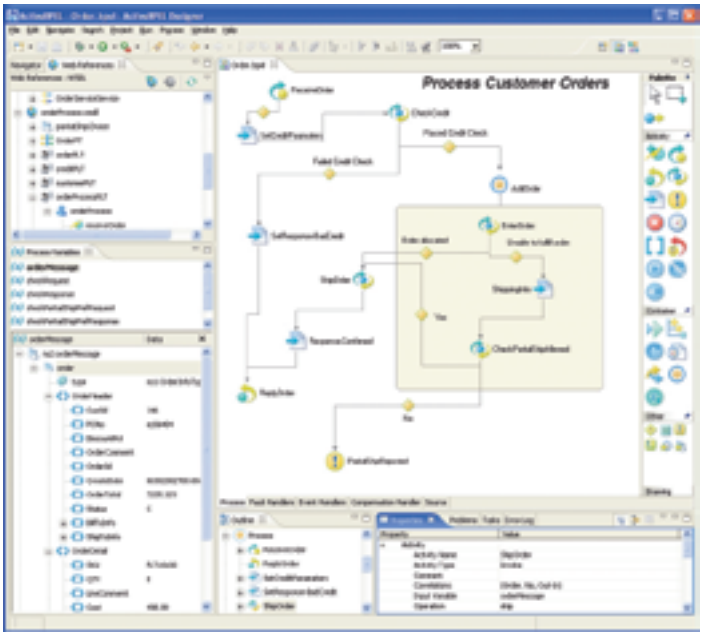

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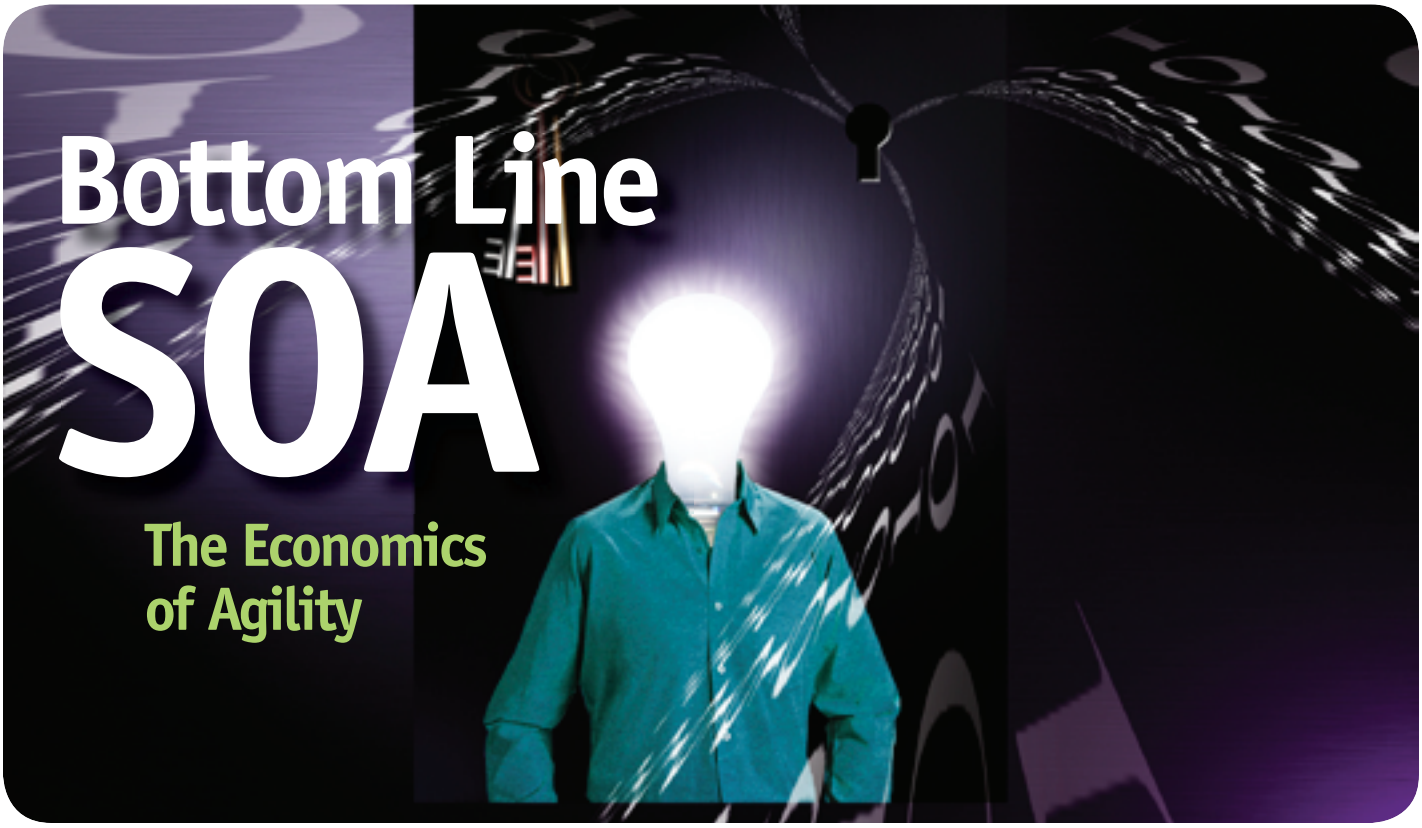


WRITTEN BY **MARC RIX**

Service Oriented Architecture (SOA) has emerged as a promising harbinger of agility, but is certainly not without its critics. Although SOA is not a new concept, it's not a mainstream approach and has not yet demonstrated widespread, repeatable success. It's no surprise then that it's often met with passionate resistance. Given the lack of SOA case studies and the fact that it usually demands a dramatic departure from the norm, SOA is often sidelined to make way for the more traditional, generally accepted point-to-point (P2P) integration approach.

In the absence of objective SOA performance data, the industry needs a simple model that compares the distinguishing characteristics of SOA and the P2P approach on a fundamental level so that we can make more objective judgments about the fit of SOA in our enterprises. This article presents such a model and demystifies the short- and long-term financial effects of each, illustrating that although each is aimed squarely at the goal of enterprise integration, their effects on the bottom line are vastly different – in fact exactly opposite.

This model demonstrates that a service-based IT infrastructure is significantly more financially sound than a point-based IT infrastructure when integrating a heterogeneous IT environment. Applying traditional enterprise architecture practices to the challenge of building agility is not only a recipe for disaster, but companies that currently rely on point-to-point solutions are likely to already be caught in financial quicksand.

The Anatomy of Agility

To effectively compare P2P and SOA they must first be put on a level playing field. This model assumes that the primary goal of IT is to leverage its technology and resources in a way that maximizes its value back to the business. Since today's businesses demand quick action in the face of accelerating change, speed of delivery is an integral component of the IT value proposition. Therefore, each of the two approaches will be evaluated on its ability to provide and sustain IT agility while maximizing return on investment (ROI). Before we dive into the math we need to define what agile IT looks like.

Fundamentally, companies need their IT organizations to turn strategic business ideas into valuable technology solutions as quickly as possible. However, what is considered quick for one company may be lethargic for another, which makes it difficult to establish a universal benchmark of agility. But let's assume that the market will select for the quickest companies, who are likely to have achieved as close to zero latency as practicable for their industries. For our purposes, agility is characterized by IT's ability to turn solutions around almost instantly.

For IT as an organization to operate in real-time, its infrastructure must also operate in real-time. This means that the technology that goes into producing solutions must be ready to be integrated and delivered at a moment's notice. Building such a product invariably involves blending the capabilities of many software functions from multiple sources into a unified package. So each component function must be ready to be called into the game at any time.

Furthermore, functions are chained together in different sequences to serve different business needs. And with potentially hundreds, or even thousands, of useful functions teeming in the typical enterprise, the number of possible combinations is enormous. To be agile, IT must assume that any of these integration "value chains" may need to be shrinkwrapped and delivered to the business at any time. The only way to meet this extreme, real-time integration challenge is to preemptively link every component in the enterprise to every other component. Otherwise, the integration work must occur after the order comes down from the business, thereby increasing time to delivery and diminishing agility. Through total connectedness IT can assemble applications by simply activating pre-integrated chains of components in a sequence that suits the business. This takes the integration step out of the delivery cycle and moves IT toward real-time execution. But what does a fully connected, agile IT infrastructure cost?

Measuring ROI

The primary unit of investment in the agile IT environment is the dedicated connection – the physical bit of infrastructure that links one component directly to another. Physical connections provide a transport mechanism through which information can flow between otherwise isolated functions. Component integration, and thereby total enterprise integration, can't happen without them.

Each connection, of course, comes with a price tag, which represents the sum of all short- and long-term expenses associated with keeping the connection in working order. Short-term costs encompass the work required to build the connection, such as planning, designing, implementing, and testing. Long-term costs stem from the work required to maintain the connection over time such as bug fixing, upgrading, and enhancing. Since these costs are directly related to work performed by humans, we will consider them all labor expenses and base them on an average blended labor rate. The investment portion of the ROI equation, therefore, will be the total ownership cost (i.e., the aggregated lifetime labor cost of owning each dedicated connection) of operating a fully connected, change-ready IT infrastructure.

Each time a component is linked to another, value-added information emerges from the IT environment. The connectedness of that environment lets IT combine information in new ways that are of value to the business. The more integrated nodes there are in the network, the more ways information can be creatively assembled the more value can be extracted. Of course, not all relationships between connected nodes will be active all of the time, which suggests a distinction between active links and passive links.

Active links are integration relationships that are "online." They are in use and serve a concrete business need. Passive links are relationships between components that exist but are inactive because the value provided by the relationships isn't currently in demand. When a business need calls for them, though, they are quickly switched on and become active. Whereas active links provide *actual* value to the business and can be used to measure the *present* value of the network, passive links provide *potential* value and can be used to measure the *future* value of the network. Since agility is a measure of both the present and future performance of IT, we are interested in both active and passive links. Therefore, the total return delivered by an agile IT infrastructure is the combined value of all active and passive connections. The ROI of the network is simply an expression of the difference between total value and total cost.

Now we are ready to begin the analysis. The remainder of the article compares two approaches to achieving total enterprise integration and evaluates them based on the ROI the resulting integration network offers back to the business. The first is the "classic" approach to enterprise architecture, characterized by simple point-to-point connections between isolated components and often favored for its simplicity and historical success at meeting business needs. The second is the SOA approach, characterized by loosely coupled reusable links between components and gaining popularity for its overall flexibility.

The ROI of P2P

IT traditionally tackles integration challenges reactively, responding to the arrival of concrete business requirements with the commencement of a software development lifecycle. Since the process unfolds within the scope of a funded project with defined schedule and resource constraints, the traditional model rewards IT for quick solutions that don't inject complexity beyond that required to satisfy the immediate business need. Any deviation outside the defined boundaries of the project is generally construed as unnecessary risk. Consequently, components are integrated using methods that have minimal impact on the project plan. The method that fits this profile best is the P2P approach, in which all isolated components are joined together through direct physical connections.

The benefits of this approach are its simplicity, low upfront costs, and long-standing reputation for getting the job done. Development teams aren't burdened by technical requirements that don't relate directly to the business solution and managers aren't accountable for expenses that don't directly support their project objectives. The consequence, though, is that each integration solution provides little or no value to any business case other than the one for which it was specifically designed. Because reuse is not a consideration, each IT component must have a dedicated, physical connection to all the others to achieve total connectedness. Let's examine the economic implications of this approach.

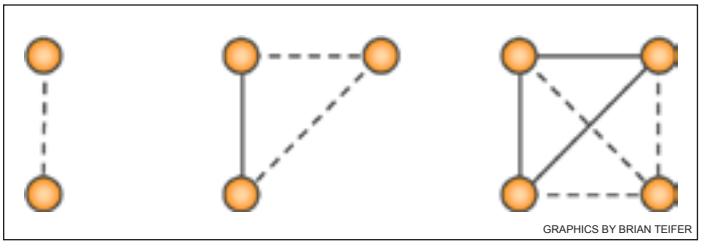


Figure 1: Evolution of a P2P network

Suppose we have an IT infrastructure, or segment thereof, consisting of 10 components that each perform a business function (e.g., "create application," "calculate credit score," "authorize user") that has value outside its native system. We wish to link them all together into an agile, change-ready network. As illustrated in Figure 1, we begin by linking two nodes together, yielding one connection. Adding a third node, we must link it to each of the first two. Adding this node has caused the total number of

connections to increase to three. Adding the fourth node requires linking it to each of the existing three, producing a grand total of six dedicated connections.

Interestingly, each time we add just a single node to the network, we must build more than one connection to link it in. In fact, the number of new links required is proportional to the size of the network at the time the component is added. Specifically, linking every component to every other component will require *N(N-1)/2* physical connections, where *N* is the total number of components, or nodes, to be included in the network. When we are finished networking all 10 of our example nodes we will be left with *10(10-1)/2 = 45* physical connections, as depicted in Figure 2.

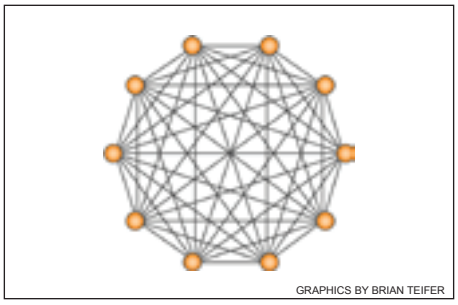
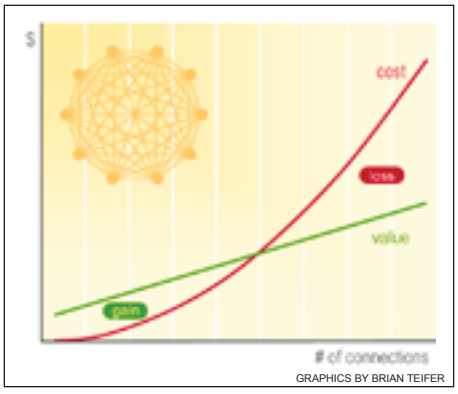

GRAPHICS BY BRIAN TEIFER

Figure 2: N(N-1)/2 dedicated P2P connections



GRAPHICS BY BRIAN TEIFER

Figure 3: Exponential P2P costs yield linear value

Let's now assume that each connection has a fixed lifetime cost. (In reality, of course, individual build-out and ongoing maintenance costs will vary, but every IT organization should be able to calculate a reasonably accurate approximation based on average labor costs and useful life.) For example, let's say it takes, on average, 40 hours of labor at a blended rate of $50 an hour, or $2,000, to build each connection. This puts our total upfront integration cost at $2,000 * 45 = $90,000.

As for maintenance, let's say that each component will need to be materially changed – such that the nodes it's connected to must be correspondingly changed – once during its useful life. Each change by itself requires an additional 10% of the initial build-out cost – in this case, $200 (.10 * $2000). At face value this may seem perfectly manageable, but remember that since each node is connected to *every other node, every change will affect every node* regardless of where the change originated. A change to one node will cause all nine of its linked nodes to change. At $200 apiece, the bill comes to $2,000. Multiply this by the 10 independent changes that we anticipate and the total maintenance cost of the network comes to *N2 * ($200) = $20,000*. The total lifetime cost of our 10-node P2P integration network is *$90,000 + $10,000 = $110,000*.

This doesn't seem too scary, but then again, we limited our IT infrastructure to just 10 components. It's doubtful that a company could react to change in real-time with only 10 high-value business functions at its disposal. The optimal size of the network will vary from company to company but it's probably safe to assume that it includes at least 100 nodes, especially when considering the range of valuable HR, CRM, contract, billing, security, logistics, loan origination, analytics, and other functions that may be present in any given IT environment. Running the cost figures above for a network of 100 fully connected nodes yields a total build-out cost of $9.9 million and lifetime maintenance of $2 million, for a total cost of $11.9 million. Taken a step further, a very large IT shop may need to network 200 or more nodes to be agile, at a total cost of more than $47.8 million. Frighteningly, as the number of nodes doubled from 100 to 200, the total cost more than quadrupled.

The P2P model does do an excellent job of keeping integration costs low at the project, or microeconomic, level. Since this is the scale at which IT historically evaluates success it's no wonder that this is the predominant approach today. The ugly truth behind this approach is that big problems begin to hatch at the enterprise, or macroeconomic, level very quickly. Each new low-cost, tightly coupled P2P connection added to the enterprise has a non-linear, compounding effect on the total lifetime cost of the overall IT infrastructure. The P2P cost model increases exponentially as the size of the network increases linearly, as illustrated by the cost curve in Figure 3. But this is only half the story. What does IT *gain* by investing in point-to-point architecture?

Every connection in the P2P network has exactly two endpoints: an information source, or provider, and an information sink, or consumer. Since the connection exposes the functionality of one provider node to a single consumer node, the business gains one unit of value from the investment in the connection. As a rule then IT can expect a return on investment of one unit of value (whatever it defines that to be) per connection in the integration network regardless of the size of the network. Therefore, the total value of the complete network of connections increases linearly as nodes are linked together. The value of a P2P network is equal to the sum of the individual values of its physical connections. Put another way, the value of a P2P network is equal to the sum of its parts.

Looking at the cost curve and value curve together (Figure 3) reveals a striking characteristic of the P2P network: the value of the network increases linearly over time while its costs increase exponentially. With the addition of each component, more money must be invested to eek out the same rate of return as the component before it. As a result of this phenomenon, short-term gains realized at the project level can explode into massive losses at the enterprise level. Indeed, this analysis paints an ominous portrait of traditional IT spending, but let's see if the service-oriented approach can do any better.

The ROI of SOA

Service-oriented architecture differs from the point-to-point approach in that it avoids dedicated hard-wired connections between components. Instead, components exchange information indirectly via shared middleware services, which act together as a distribution "hub" for messages traveling between isolated nodes. Components in a SOA network always interact with the service hub, never directly with each other. Moreover, the link any component has with another component is a virtual link, in that the two are connected implicitly via the hub, not explicitly through a physical connection to each other. This architecture shields any node in the network from the technical details of all other nodes, resulting in a web of loosely coupled integration relationships that spans the IT infrastructure. This characteristic of SOA is extremely powerful because it significantly reduces the number of dedicated connections, and therefore overall costs, required to build and operate a fully integrated agile network.

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Let's apply the SOA approach to our 10-node infrastructure. Just as with the P2P approach, we begin by linking two nodes together. This time, however, we must incorporate the service hub as an intermediary between the two functional nodes. We see right away that this requires more architectural complexity than creating a point-to-point link between two nodes. To begin with, the service hub represents an additional piece of infrastructure that must be added to IT's inventory. Next, two physical connections (one from each node into the hub), instead of one, must be built to complete the integration. Unfortunately, this increase in complexity naturally begets a corresponding increase in spending.

Our first two nodes have yet to be linked and there are already clear signs of cost increases compared to the P2P approach. Project-oriented, date-driven IT organizations have a big problem with how SOA presents itself at this level. Managers are apprehensive about taking on the burden of delivering this extra layer of complexity and project controllers are reluctant to approve funding for it. At this microeconomic level, it's easy for SOA to be stifled because it inflates scope and budget precisely where scope and budget are scrutinized most heavily. However, welcoming a bit more investment at the project level can pay off handsomely at the enterprise level.

Continuing with the example, things begin to improve as soon as we get beyond integrating the first two nodes. (Figure 4) In the P2P model, linking the third node into the network required two additional physical connections. In the SOA model, one is sufficient. Because the first two components are already members of the network, node three gains access to them implicitly via virtual connections through the hub. Similarly, the fourth node gains

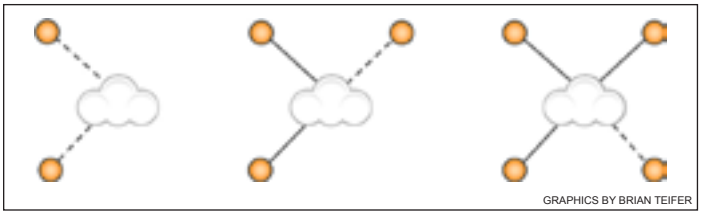

Figure 4: Evolution of a SOA network

virtual access to all existing nodes when it's attached to the hub. By contrast, linking the fourth node into the P2P network required three additional physical connections.

When all 10 nodes have been fully integrated into the network, that is, when all 10 nodes can share data with all other nodes, the network will be composed of just 10, or N, physical connections – less than a quarter of those required by the P2P network. Only one additional physical connection is required to fully link one additional node to a service-oriented network, regardless of the size of the network. (Figure 5) Now that we know how many connections there will be, let's examine what it will cost to build and maintain them.

Again, each connection has a total cost comprised of initial build-out and lifetime maintenance expenses. We will assume that connecting a node to the service hub entails roughly the same complexity as linking it to another node, so the build-out cost of each physical connection will remain $2,000. However, the additional cost of the service hub itself must be accounted for.

For simplicity's sake, we will spread hub expenses evenly over the network as a "tax" on each connection. The complexity of the service hub should grow with the complexity of the network so that hub costs are kept commensurate with connection costs. We will tax each connection at a very generous flat rate of 100%, meaning that each integration project will allocate equal resources to building connections and enhancing the service hub. This effectively doubles the build-out cost of each connection to $4,000. The resulting build-out cost of our 10-node, fully connected service-oriented network comes to *N * ($4,000) = $40,000*.

We will assume again that maintenance costs equate to 10% of the build-out cost per connection – in this case $400. This time, though, we don't have to account for tight coupling between nodes. When a node changes materially in a SOA network the change is insulated from all other nodes. At most, the service hub will have to be brought into compliance. We will conservatively assume that this will always be the case; a change to one node will always require a corresponding change on the hub. This will produce a lifetime node maintenance bill of *N * 2 * ($400) = $8,000*.

In addition, the hub itself represents a new source of ongoing maintenance. When it changes, the effect will likely reverberate through the network requiring corresponding changes to all nodes. Again, let's say this happens once during the life of the network and equates to *(N+1) * ($400) = $4,400*. Summing the two maintenance figures gives a total SOA network maintenance cost of $12,400, yielding a total lifetime cost of $52,400 – roughly half the total cost of the P2P network. A 100-node SOA network would cost $120,400 (1% of the cost of a comparable P2P network). A 200-node SOA network would cost $240,400 (0.5% the cost of a comparable P2P network). In the case of SOA, doubling the size of the network from 100 to 200 nodes also doubles its total cost, producing a linear effect.

Let's now look at return on investment. Recall that, in general, the return on one connection is a function of the number of nodes that can leverage the connection. In the P2P network, each connection links one provider to one and only one consumer. Thus, the return on a single P2P connection is always one unit of business value. On the other hand, each physical connection in the SOA network links one node to *all* other nodes via virtual connections through the hub. The return on a single SOA connection then is proportional to the size of the network. This means that the value of the SOA network increases exponentially as its size, or number of nodes, increases. The value of the SOA network is *greater* than the sum of its parts.

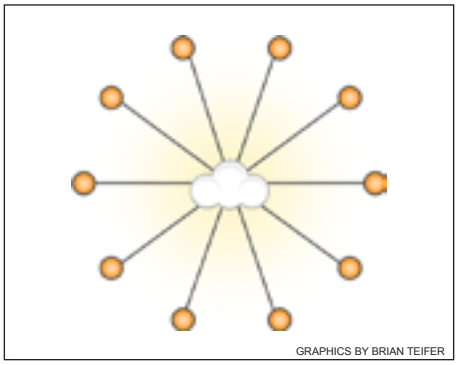

Figure 5: N Dedicated SOA connections

Examining the SOA cost and value curves together in Figure 6, we see that the graph mimics the P2P graph almost exactly: each contains one curve with a linear progression that intersects a curve with a non-linear progression. The fundamental difference, however, is that the curves' labels have been swapped. The exponential P2P cost curve has evolved into a linear SOA cost curve and the linear P2P value curve has evolved into an exponential SOA value curve.

The value of the SOA network increases exponentially over time while its costs remain linear and predictable. Upfront costs will likely be higher for SOA than P2P producing temporary deficits at the project level, but they pave the way for disproportionately high returns at the enterprise level. Once the breakeven (intersecting) point is reached, SOA delivers runaway value without negatively impacting its cost structure.

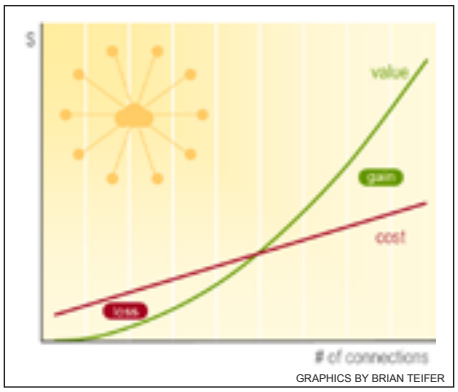

Figure 6: Linear SOA costs yield exponential gains

The Bottom Line

Agility is the Holy Grail anxiously sought by today's IT organizations, and the quest begins at a fork in the road. One stretch cuts through familiar P2P territory and is easily navigable by intuition; the other winds through the mysterious, uncharted regions of SOA. Many companies have been enchanted by the folklore about the SOA route but have ultimately turned away from it (or strayed from it) out of fear and uncertainty, choosing to travel the well-beaten path of P2P instead. They have chosen poorly.

The journey to agility comes at a price and IT must be ready to endure both the short-term and long-term financial burdens of its trek. Point-to-point architecture carries seductively low upfront costs, resulting in little impact at the project level. The ability to create integrated solutions with no impact on prevailing business practices makes P2P the instinctive favorite. However, microeconomic stability can quickly fester into macroeconomic chaos. As more and more one-off solutions are piled atop one another, IT maintenance costs swell exponentially and connection sprawl strangles the infrastructure. This often results in the full dedication of IT resources toward simply "keeping the lights on," leaving little left over to support new strategic business initiatives. Companies that adopt the P2P approach must be prepared to experience increasingly negative returns on their IT investments.

SOA presents exactly the opposite model. Higher upfront expenditures are required to ensure loose coupling between linked components, which inflates project budgets. This translates into initial financial losses at the microeconomic level and often catapults projects beyond conventional thresholds of risk tolerance. However, if this aversion to early-stage risk can be overcome, investments in SOA at the microeconomic level can blossom into colossal benefits at the macroeconomic level. By dramatically reducing the number of physical connections in the infrastructure and leveraging no-cost virtual connections to achieve everything-to-everything connectivity, SOA's return on investment increases exponentially as the infrastructure grows. Furthermore, since SOA keeps infrastructure costs linear and scalable, IT always has resources free to innovate and respond to changing business needs. SOA may be the road less traveled by, but for companies seeking agility it will make all the difference. ■

About the Author

Marc Rix is a lead SOA solutions architect at SAIC, focused on accelerating key business activities through SOA and BPM. He has been building enterprise-scale integration solutions for the past 10 years.

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SOA, On-Demand, Becoming a Reality

—continued from page 4

SOA. I think that if they're successful using the SOA platform, most will stay.

Finally, larger organizations may find that Salesforce SOA is the mother of all SOAs when it comes to binding enterprises together to form value chains, or even integrating distributed companies into a single collection of services using Salesforce SOA as a mechanism for central interoperability, as well as service and process exchange. Moreover, the world of mashups is exploding and this platform is perfect for supporting a mashup creation platform on-demand since it's all out there on the Web.

It will be interesting to see how the larger SOA stack players react to this announcement. Now, SOA architects, developers, and process designers have a less-expensive way to build, deploy, orchestrate, and manage services using a holistic single source stack. The best-of-breed players will actually benefit from this technology. You still need bit players to bring it into the enterprise, abstracting and managing data movement, interfacing with core systems, and even building SOAs that interact with an on-demand SOA such as this.

If you've been monitoring my career, as well as my postings, you already know that I'm bullish on SaaS, and SOA, and I see the two merging as complementary concepts. Indeed, we're now seeing SaaS companies move into the platform space, selling beyond enterprise applications into databases, application development, integration, and even operating systems, all on-demand.

As already said, an on-demand platform supports multi-tenancy. In contrast to single-tenant counterparts, multi-tenant platforms share a single common infrastructure and code base that is centrally maintained. Individual customer deployments are unique, separate, and secure in this shared multi-tenant platform, and run a single code base that's shared by all users and upgraded simultaneously.

So, why should you care? Well, this does change the game of both enterprise architecture and SOA. It doesn't change the core concepts, but the fact that, as an option, you can use the key technology on-demand through a subscription, and so at a fraction of the buy-in price we're paying now for software and hardware we host on our own. Again, this doesn't change the core notion of SOA; only the ways to deploy it. This could make SOA much more affordable and easier to implement, and also let resources be shared on-demand. Those are good things. ■

Are You Ready for Mashups?

Their real value is in the enterprise

WRITTEN BY **ANANT KADIYALA**

With the emergence of Web 2.0 and SOA technologies, mashups have gained in popularity. Web 2.0 provides a rich user experience, and SOA technologies facilitate the underlying flexible plumbing required to make mashups happen. So you could say mashups are a mashup of Web 2.0 and SOA!

If you're reading this article, mashups have been on your mind, and you probably caught some of the buzz from the likes of Google, Yahoo, eBay, and Amazon. Mashups on the Web from public APIs have a cool factor, but the real value of mashups is in the enterprise. Enterprise mashups facilitate information at your fingertips in the right context. Here we'll delve deeper into enterprise mashups and the factors you need to take into consideration for a successful mashup strategy and lifecycle.

With mashups in the enterprise, you combine different streams of information to provide actionable knowledge to the stakeholders. The concept behind mashups is that the value of a mashup is greater than the sum of its individual parts. There are essentially two kinds of mashups: (a) mashups at the UI and (b) mashups at the business layer. Let's observe these two types in more detail.

Mashups at the UI

UI mashups aggregate and overlay information at rendering. Web 2.0 technologies make the user experience friendly, rich, and lightweight. Services from Google and Yahoo fall into this category. For an enterprise scenario, consider the following examples:

- **Example 1:** Utility companies such as power, telephone, and cable tend to have regional outages. Let's say there's been an overnight storm and the residents in the 90210 Zip code have lost power. The power company has all the information related to managing this outage, but in various silo'd systems. The customer information is in SAP; field technician location information is in a workflow system; affected homes are registered in a trouble ticket system, and so on. What would be valuable to the stakeholders managing this outage is a mashup of information from all these systems. A 360-degree view of the outage as a single one-stop-shop dashboard would make crisis management more efficient as all the necessary information would at the decision makers' fingertips.
- **Example 2:** It' the end of the quarter and your company's regional sales directors would like to create war rooms to track and manage all the key deals for the quarter. Today in most companies this is managed by fax, phone, e-mail, and a CRM system like Siebel. Once again, what would be very valuable and efficient is to have the consolidated information of deals, contacts, legal, finance, sales operations, all working off of the same dashboard and set of information instead of e-mailing each other Excel spreadsheets.

Today these kinds of dashboards or user- and context-centric functional consoles are built with hard-wired connections to back-end systems for pre-determined use cases. They do not lend the flexibility of the stitched-together on-demand capability that mashups offer.

At first glance one might say, "What's the big deal about these dashboards? Companies have been doing them for decades." That's a valid argument. With each generation of new technologies, however, building user-centric and context-centric information is getting easier and cheaper. We've heard of composite portals. Mashups still carry forward that concept except that they take the game to the next level. Mashups significantly lower the barrier to entry. If designed right, one doesn't need to have much technical knowledge to assemble a mashup. That's the Holy Grail. This means that once IT provides the underlying services, business users can then quickly assemble mashup-based applications by leveraging easy-to-use GUI widgets. This is the philosophy on which Yahoo Pipes is built.

Mashups at the Business Layer

While mashups at UI are themselves valuable, mashups at the

business layer (MBL) can be even more powerful. The tooling for MBLs would be different than that for UI-based mashups. MBLs also would require knowing languages like XML and XQuery. These developers are adept at quickly stringing together an MBL based on existing base level services. There are already standards and specifications in the works (such as Service Component Architecture (SCA) and Service Data Objects (SDO)) that facilitate service assembly. MBLs could then be leveraged at the UI or at other tiers in the composition chain.

For those who have been entrenched in the SOA world for the past few years, this may look like the notion of Composite Services. In a way, MBLs are very similar to Composite Services. The key difference is that Composite Services, as we know today, are more use case-specific and have harder links to back-end systems. MBLs are virtual by nature and independent of the architecture of underlying base services. Looking at this another way MBLs would be built on top of Composite and base services. MBLs are logical in architecture, while most Composite Services are physical in architecture. Also, if technologies like virtual data services and workflow are thrown into the mix, MBLs can offer services that are suited for multiple contexts that can be quickly wired together to form a new mashup. MBLs, therefore, bring down the cost of integration significantly and unearth valuable information buried in the enterprise back-end systems.

The concept of MBLs is not new concept – some of the forward-looking SOA architectures have already been leveraging this type of approach. MBL is more of a design pattern. This article just brought this pattern to light.

The Network Effect

The true power of mashups will only be realized when there is a strong Network Effect. According to Wikipedia, a Network Effect is a characteristic that causes goods or services to have a value to a potential customer that depends on the number of other customers who own goods or use the service. The Internet is built on this phenomenon. The more people contribute and leverage the Internet, the more value it offers. Similarly, public transportation like subways play to a Network Effect as well. The more elaborate the network is, the more we tend to leverage its services, and the more value we get out of the system.

Similarly, as you put up more services, the power of AND kicks in, and the more valuable the service portfolio gets. After a certain threshold of services, your mashup and service infrastructure could even be a differentiating factor against the competition. With its ease of use, business stakeholders can quickly assemble workspaces, collaborate, and make timely decisions. In the earlier example, just imagine the outage team being able to manage the process, resources, and people in a streamlined way due to better access to information. Information is power. That's what mashups are poised to provide.

Governance for Mashups

To realize the benefit of Network Effect for services, proper control and governance measures are essential. Without governance, services would be misused and the infrastructure would quickly fall apart. As an analogy, think about traffic rule. Roads are a powerful transportation mechanism. Without rules, however, roads would quickly become unusable. The same logic applies to services in an enterprise. They need to be governed and managed carefully.

In most organizations, SOA governance (and by extension mashup governance) typically revolves around four main areas – security, performance, change control, and compliance. Governance can be broadly classified into two types: design-time governance and runtime governance. Both have to address the four core areas mentioned above. The topic of governance in itself is a vast subject and an article like this can't do it justice. But here's a quick look at what it has to addresses – especially in the context of mashups and services.

Design-Time Governance

Governance at this stage typically involves:

- Policy-based access control, so that unauthorized teams/individuals don't tap into the service.
- Defining Quality of Service (QoS) metrics such as service level agreements (SLA), performance guarantees, and other policies associated with the service.
- Mapping and managing dependencies between underlying services.
- Compliance requirements such as HIPAA and SOX may impose additional policies as well. For example, there may be policies around the ability to change the service contract or SLAs.

Runtime Governance

Governance at this stage is mostly about *enforcement*. It typically involves:

- Restricting the access to a resource based on pre-defined authorization rules.
- Raising an alert (and optionally generating a report) if a given service violates an SLA. Some companies use automated scripts to execute appropriate action(s) based on the SLA violated.
- Managing deprecations and end-of-life for services (in a transparent manner to the client)
- Compliance requirements may require stringent auditing for non-repudiation and transaction tracking.

An important aspect that transcends both design-time and runtime governance is protecting the underlying services (and back-end systems) from the extra load imposed by new mashups. This is where access policies to services even at design-time become very important. If a developer or business user creates a new mashup that puts strain on the back-end systems – the load requirement should be designed and planned for end-to-end. Many times, the existing services may need to be modified or extra hardware added to support a new load. Therefore, understanding the usage patterns for the functionality offered by a given mashup is important. Many companies, as a best practice, form a Center of Excellence (CoE) that monitors and manages the governance process.

Conclusion

You've probably realized by now that mashups, as powerful as they are, require significant responsibility and discipline in an organization. If not, they may cause more damage than good. However, this shouldn't deter companies from taking full advantage of their enormous benefits. The benefits of mashups far outweigh the governance overheads. There are also tools in the market that offer good solutions around service infrastructure and governance. So plan, execute, and reap the magic of mashups.

About the Author

Anant Kadiyala is an SOA solutions architect at BEA Systems, where he advises Fortune 500 companies in the technology and governance aspects of SOA strategy. Anant is also a frequent speaker at conferences and user groups.

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Pragmatic SOA Interoperability

Architecture, not new middleware

WRITTEN BY **JESUS RODRIGUEZ AND JAVIER MARISCAL**

A well-planned Web Service interoperability environment begins by clearly defining who your Web Service consumers are now and in the future. There was a time not so long ago when you could count on a fairly homogenous consumer population. This was about the same time that you were happy just to be able to get a Web Service running in the first place and finding a consumer who could actually interact with your Web Service was cause for celebration. Those days have changed however and Web Services interoperability, once a "fancy" addition to your SOA design, is now a key and indispensable requirement in most SOA scenarios.

Today, SOA architects must contend with complex scenarios that assume a variety of Web Service consumers or in many cases are asked to create Web Services that are generic enough to be interoperable with just about any known consumer. If you're serious about implementing SOA in your worldwide enterprise you'll have to forget about the luxury of being able to dictate the configuration of all of your consumers and instead build fully interoperable Web Services. Most robust Internet Web Service APIs, familiar to all of us such as Amazon.com, eBay, or Salesforce.com, have learned this lesson already with very successful results. Those companies know that Web Service interoperability lies in the architecture approach and not in the implementation of new middleware.

What Makes Interoperability So Challenging?

Standards Proliferation and Complexity

The interaction between Web Services and consumers is rooted on a set of standards developed by standards organization committees at OASIS, W3C, and WS-I. These standards such as XML Schema, SOAP, WSDL, and WS-* protocols are intended to provide a technology-agnostic level of abstraction over the service implementation which should theoretically guarantee interoperability. However, it's not the standards themselves, but their implementation by individual Web Service technology vendors that must be interoperable. In a perfect world, every vendor would implement Web Services standards in exactly the same way, which would guarantee interoperability out-of-the-box. As you must know, that's just too good to be true. In the real world, every vendor implements these standards sometimes with just slight variations and other times entirely different versions. In many other cases vendors choose which aspects of a standard to implement, or maybe even choose not to

implement a given standard at all. This proliferation and complexity is most obvious when we look at the WS-* protocols.

When this article was written, up to four different WS-Addressing versions were in use. Three versions of the specification are named by their release date: the March 2003 version, the March 2004 version, and the August 2004 version, developed before the specification moved to W3C. The fourth version, 1.0, was completed in May 2006 and developed after the specification went under the W3C umbrella. And if that's not confusing enough, after moving to W3C, the specification split into multiple parts: a core specification and two other specifications that describe bindings for SOAP and WSDL.

There are also different WS-* protocols that address very similar scenarios such as WS-Eventing and WS-Notifications, WS-MessageDelivery and WS-Addressing or WS-Reliability and WS-ReliableMessaging. Committees from OASIS and W3C are working to unify those overlapped protocols into a single set of standards. Vendors can and often implement different versions of the same WS-* protocol or implement one of multiple similar standards such as WS-ReliableMessaging instead of WS-Reliability.

Although the combination of SOAP and WS-* protocols provide a solution for some of the most interesting challenges in distributed computing, the complexity of this approach makes it impractical and nearly impossible to implement in real-world interoperability scenarios. Just a small subset of the over 100 WS-* standards specifications available today have been implemented by vendors. One last, but certainly not least, challenge involved in using SOAP and WS-* protocols is that they can also limit the service availability to clients such as script applications or Web browsers that don't support that generation of SOAP messages.

Best Practice: Use WS-I Profiles

Some WS-* protocols have a WS-I profile available that contains some of the principles and a subset of features of the protocols that should be implemented to guarantee interoperability. Making the services compatible with a WS-I profile (is this one exists) is a standard and globally accepted approach to interoperability. However for some protocols, a WS-I profile isn't available or doesn't address the interoperability requirements.

Best Practice: Implement Multi-Binding Services

To support multiple versions of the same WS-* protocol it's recommended to design the services with multiple bindings per specific versions of the protocol. This approach segments the different types of interactions at the binding level improving aspects like versioning, management, etc. The code in Listings 1 and 2 illustrates a sample Microsoft Windows Communication Foundation (WCF) Service configured to support multiple types of interactions using bindings. Specifically, this service supports secure and reliable interactions as well as basic SOAP interactions using two different bindings.

Best Practice: Exposes SOAP and REST Interfaces

Resource State Transfer (REST) provides a simpler alternative to the use of SOAP and the WS-* protocols for some scenarios. The fact that REST is based on XML messages over HTTP makes it accessible to most of the client technologies on the market including browsers and script languages. Some services can expose both SOAP and REST interfaces and offer a broader set of options to consumers. The example in Listing 3 illustrates that approach using Oracle Application Server.

Aligning Code and Contract

When designing a service you must first consider where to start. Do you create your code first or your contract first? Or do you give them each equal importance by creating them in parallel. However, even if you were extremely diligent in developing perfect synergy between your code and your contract you would still find that the limitations of the basic standards themselves, such as XSD and WSDL, could easily do you in. For example, the XML Schema model presents severe limitations in terms of composability compared with most programming languages data structures. This is often reflected in non-optimal translations between XML Schema structures and programming data structures. Similarly, WSDL 1.0 and 2.0 are both too abstract for describing services that can be interpreted by Web Services frameworks in a consistent way.

There's a lot of debate in the Web Service community around whether to use a contract-first versus a code-first approach to develop Web Services. One of the common arguments in favor of a contract-first approach is that it facilitates interoperability. Whether that's arguably true, the reality is that just a few mortals know WSDL and XSD well enough to design solid service contracts. Given the complexities of both standards developers often end up designing non-optimal WSDLs and XSDs that are translated into poor service implementations. On the other hand, a code-first approach is more familiar to developers but can produce contracts that aren't interoperable.

Best Practice Recommendation

Some of the most successful Web Service implementations have been designed using a hybrid approach that combines the agility of a code-first approach with the flexibility of a XSD/WSDL-first approach. Following these technique developers can leverage their existing skills on a particular development platform to guarantee an optimal service implementation while the WSDL-XSD experts verify that the contract is suited to meeting the interoperability needs. Figure 1 illustrates this approach.

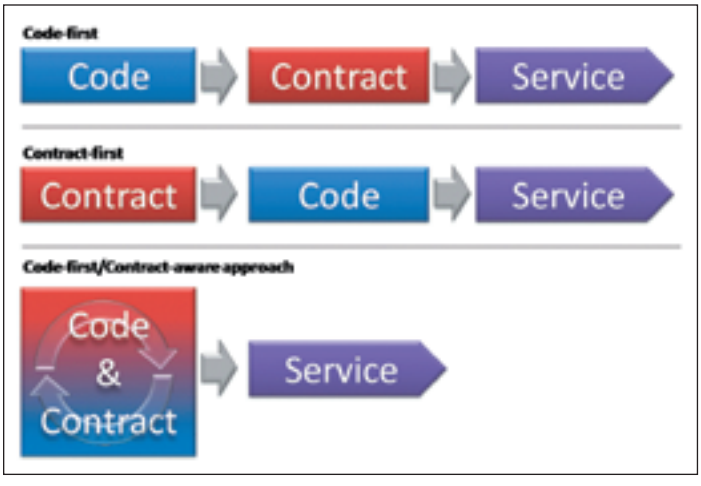

Figure 1: Code-first/contract-aware technique

Multi-Transport Services

SOAP, WSDL, and the different WS-* protocols are transport-agnostic specifications. Theoretically it's possible to host the same service using multiple transports such as HTTP, TCP, JMS, etc. Although this feature is supported by some of the Web Services technology frameworks on the market such as Windows Communication Foundation

(WCF) or Apache Axis, only HTTP has been adopted widely enough to be considered for interoperability scenarios. Another factor to consider when implementing multi-transport services in real-world scenarios is that certain transports require a specific behavior of the service. For instance, a Web Service that uses JMS as a transport probably implements one-way, long-running, and asynchronous operations. That behavior is fundamentally different from a Web Service that uses HTTP as a transport on which it makes sense to implement atomic operations using different multiple exchange patterns. Hosting the same Web Services using JMS and HTTP makes little or no sense in most of the scenarios.

Best Practice

To design interoperable non-HTTP hosted Web Services use transport protocols that are vendor-agnostic such as TCP, UDP, etc. Similarly, use a transport protocol that corresponds to the expected runtime behavior of the service. It's also a good practice to test interoperability using the components of the Web Service technology stack that interact with the transport such as WCF transport channels or Apache WSIF bindings.

Versioning Strategy

Services are subject to evolve during their lifetime. That evolution often forces changes on the consumers that break the level of interoperability achieved by the solution. Evolving enterprise consumers and services together is not only a very expensive operation that requires massive levels of coordination between both sides; but also violates the autonomy principle of service orientation that says that services should be deployed and modified/maintained independently of each other and the systems that use them.

Best Practice

Define a versioning strategy that considers the interoperability with the existing service consumers. Keeping multiple active versions of the same services maintains a level of interoperability that's not going to leverage the features of the new version. Only implement non-breakable changes at the service, data, and message contract level. Also consider using multiple bindings when changes are required at the transport or message-encoding level.

Stateful Services

A lot of the SOA scenarios in real-world enterprises require stateful services interactions. Those services can maintain the state between calls and are mainly used for long-running operations. Achieving interoperability with those services is always a challenge mainly because there's no widely adopted standard for persisting the state of a service between calls.

Best Practices

When implementing stateful interoperable services; expose the state key using mechanisms that are available to the potential consumers. Typical mechanisms include SOAP headers or transport-specific headers. Also, depending on the scenario, offer different ways for consumers to send the state information.

Governance Interoperability

SOA governance is a key component of a successful SOA solution. However the capabilities of a SOA governance framework are often limited to its capacity for interoperating with multiple services. A successful SOA governance solution requires interoperability between different SOA components such as policies, contracts, or versions that are modeled differently on different Web Services frameworks.

Best Practice

A good practice for guaranteeing interoperability on a SOA governance solution is to have a global representation of the different artifacts such as policies and contracts globally stored on a SOA registry or repository. This approach facilitates sharing global policies, contracts, or SLAs across different business services. Also for some scenarios the global representation needs to be translated to the specific technology representation using some specific technology-specific adapter.

Creating the Interoperable Web Service – Lessons from the Internet

If you've made it this far you might be convinced that it's impossible to create interoperable Web Services. However if we look at the Internet we can find Web Services APIs such Amazon.com, eBay, or Salesforce.com processing millions of requests a day from millions of consumers using a heterogeneous set of technologies ranging from scripts languages such as Perl or PHP to more established enterprises development frameworks such as J2EE or .NET. How did they do it? The following lists some of their secrets for achieving interoperability across the world's largest and most heterogeneous network.

- **Simple services, data, and message contracts:** Contracts exposed by successful Internet Web Services APIs are very simple and hide the detail of very complex implementations. This guarantees first-level interoperability with a variety of technologies.
- SOAP and REST APIs: Going beyond the debate of whether to use SOAP or REST, the fact is that both approaches can be applied to some scenarios. Supporting SOAP and REST interfaces gives the service consumer the opportunity to select the best approach for a particular scenario.
- **Optional use of WS-* protocols:** The implementation of most WS-* protocols is an almost exclusive privilege of .NET, J2EE, and C++. Other programming languages like Ruby or Python are just starting down the path of supporting basic Web Service interactions. The use of WS-* protocols should be an optional capability for consumers that can support it and never a mandatory requirement.
- **Consumer-driven contracts (the Einstein approach):** Forcing a single set of contracts across all consumers is not always a wise decision. That approach makes consumers dependent on aspects of the contracts they might not be using. It also ties the evolution of the consumer application to the evolution of the contract

Aligning the Path for Service Orchestration & Composition

Achieving interoperability is a key requirement for service orchestration and composition. During the last few years the industry has produced several standards and technologies for service orchestration and composition such as Web Services Business Process Execution Language (WS-BPEL), Service Component Architecture (SCA), and the Web Services Choreography Description Language (WS-CDL). All of those standards are based on coordinated interactions between different Web Services endpoints. However, Business Processes and Composite Services are only as good as their capacity for interacting with different services developed on different technologies. Implementing interoperable services guarantees that those services can be used as part of orchestrations, choreographies, or composite services to address more complex scenarios.

Sound Architecture Requires Proper Planning

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itself. Having a more consumer-oriented contract approach on which consumers interact with contracts that contain the specific elements that are relevant to their scenario facilitates aspects like versioning, policy control, etc. We often call this the Einstein approach to service orientation in which every consumer has its own view of the universe instead of a Newton approach in which all the consumers share a single view.

- **Versioning Strategy:** Internet Web Services APIs are subject to evolving given the dynamic nature of the Internet. Keeping multiple versions of the Web Services doesn't force clients to migrate to a new version that doesn't bring any value to them.

Conclusion

This article has explored some of the key challenges in achieving Web Services interoperability in real-world SOA deployments. It detailed best practices and techniques architects can apply to enhance the interoperability of an SOA solution. The complexity of SOA standards is by far the key factor that affects the interoperability of Web Services. Overcoming that complexity is an exercise that involves best practices throughout the entire solution lifecycle. Designing interoperable services facilitates their use in other SOA solutions such as service orchestration, composition, or governance. ■

About the Authors

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Listing 1

WCF service implementation

```
[ServiceContract()]
public interface IMyService
{
    [OperationContract]
    int MathOp(int param1, int param2);
}

public class MyService : IMyService
{
    public int MathOp(int param1, int param2)
    {
        return param1*param2;
    }
}
```

Listing 2

Multiple endpoint-binding configurations

```
<configuration>
  <system.serviceModel>
    <services>

      <service name="MyService" behaviorConfiguration="returnFaults">

        <endpoint address="/MyServiceEndpoint1" contract="IMyService"
binding="wsHttpBinding" bindingConfiguration="SecureReliableBinding"/>

     <endpoint address="/MyServiceEndpoint2" contract="IMyService"
binding="basicHttpBinding" bindingConfiguration="BasicBinding"/>

    </service>
    </services>

     <bindings>
            <wsHttpBinding>
                      <binding name="SecureReliableBinding">
                                <reliableSession enabled="true" />
                                <security mode="Message" />
                      </binding>
            </wsHttpBinding>

            <basicHttpBinding>
                      <binding name="BasicBinding">
                                <security mode="None" />
                      </binding>
            </basicHttpBinding>
     </bindings>

     <behaviors>
       <serviceBehaviors>
         <behavior name="returnFaults" >
                    <serviceMetadata httpGetEnabled="true" />
           <serviceDebug includeExceptionDetailInFaults="true" />
         </behavior>
       </serviceBehaviors>
     </behaviors>
  </system.serviceModel>

  <system.Web>
    <compilation debug="true"/>
  </system.Web>
</configuration>
```

Listing 3

Configuration for supporting both REST and SOAP messaging

```
public class MyService
{
public int MathOp(int param1, int param2)
    {
      return param1*param2;
    }
}
```

Oracle Web Service implementation

```
<oracle-Webservices xmlns:xsi="http://www.w3.org/2001/XMLSchema-in-
stance" xsi:noNamespaceSchemaLocation="http://xmlns.oracle.com/ora-
cleas/schema/oracle-Webservices-10_0.xsd">
    <Webservice-description name="MyWebService1">
        <port-component name="MyWebService1SoapHttpPort">
            <rest-support>true</rest-support>
            <operations>
                <operation name="MathOp" input="{http://interopsample/
types/}MathOpElement"/>
            </operations>
        </port-component>
    </Webservice-description>
</oracle-Webservices>
```

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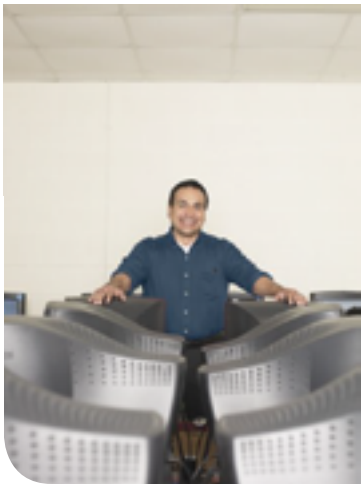

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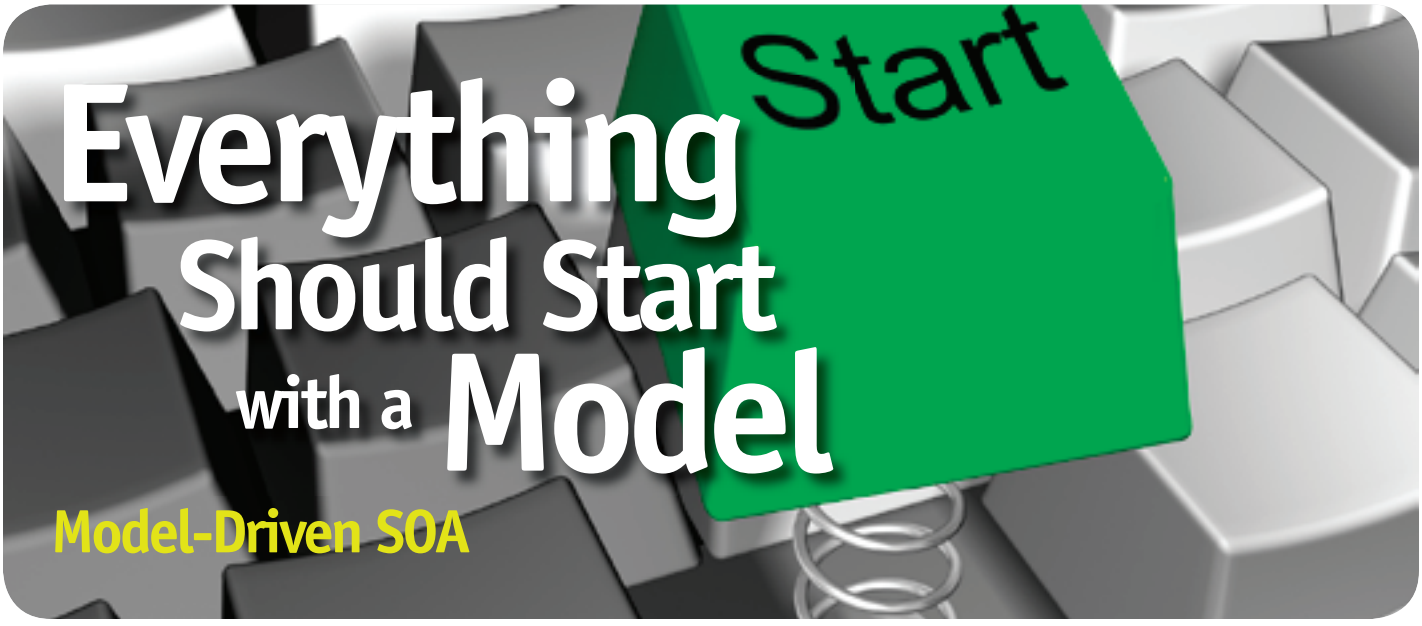

Everything Should Start with a Model

Model-Driven SOA

WRITTEN BY **IAN THAIN**

In this article I'll cover how a model-driven design and development process can pave the way to a Service Oriented Architecture that will in turn produce accurate applications that meet business needs and increase development team productivity.

SOA is hot topic in our industry right now. One of the important aspects of SOA is that it's a business approach and methodology as much as it's a technological approach and methodology for developing distributed computing systems.

SOA is a software architecture for building applications that implement business processes or services by using a set of loosely coupled components orchestrated to deliver a well-defined package. With SOA, existing software assets already in use are packaged in such a way that they're self-contained, loosely coupled, and can be called and executed by other new applications as a service. Any new computing modules would be created as services the first time around, and so would enter into the services library to be used over and over again. Well, to call a service, we have to know how to call it, where to call it, and what to expect back as a response; that is, a service must have a callable interface that's well defined, well published, and well secured. In short, not only should a service be good quality code, it must be well understood and well documented.

How Many of You Have Done This or Seen It Happen in Your Organization?

A business analyst sketches out a system feature-by-feature, either on paper or using a flowcharting tool and hands it over to a team for development.

When the system comes back from development for testing, the analyst returns to his sketch and system tests the functionality of each feature, one feature at a time.

Whenever a feature doesn't perform as the analyst thinks he defined it, he makes a note that goes back to the developers, who make changes to the code, and the whole thing starts again...all manual, all by hand. And remember the testing team isn't always made up of analysts who wrote the "sketch"...it's a perfect world assumption that the analyst and some business users are testers along with the testing professionals. How many understandings of the "system" are in that group and how many "notes" go back to development teams? How Neanderthal!

We are no longer Neanderthals. We now have modeling tools. We now have iterative and prototyping development processes. Programming language technology has advanced such that all of our well-meaning attempts at good modular programming over the years can be expanded into bigger modules with more of a business meaning. We recognize the need to communicate and collaborate. It's taken us 40 years...but we're getting there. The idea of architecture implies a thoughtful plan using a standard set of guidelines and rules to construct a blueprint. A good software architecture will have the blueprints for how data is stored, how users interact, how blocks of functionality (services) are linked together to form programs, how programs communicate, the capacity needed of the hardware, and so forth.

The idea behind SOA is that these blocks of functionality (services) are available to be used by many programs, and that, over time, when you have more and more services those programs can be compiled and put together more quickly. And since the services are already defined, their design can be reused too. Also, if a service implements a specific business function or rule, it's simpler, more cost-effective, and less time-consuming just to change the related service code rather than search through all the independent programs for code that may have implemented that business rule and then change all the programs using it like we used to.

Of course, you still have to test it, but the actual design and development time to implement a change from the business is much less of an impact when you have models to work from, impact analysis reports to guide you, and independent services to change.

A set of loosely coupled components does the same work that used to be done inside tightly structured programs. But now the components can be combined and recombined in many ways. This makes the overall infrastructure more flexible and agile. This way SOA can make it easier and faster to build and deploy IT systems that directly service the goals of a business and we can prove it because we have our models of the SOA architectures linked directly back to the model of our business goals, business requirements, and business processes. Not only do we reuse the code, we reuse the models.

Model-Driven SOA

The whole point of SOA is to make business applications more manageable, more flexible, and more responsive to change. Businesses are constantly changing how they do things – not necessarily changing what they do. Models allow the business people to focus and change the business processes and workflows without having to focus on the technological plumbing. The IT folks can focus on designing, changing, and improving those business processes by codifying the business services. The models are their common point of communications and it documents the agreements of what needs to be done. Models can automate and drive impact analysis for better communication between IT and business and, when enough textual information has been captured, most modeling tools can generate quality code that provides a good start toward overall development.

Sybase's view of modeling (Figure 1) is that in an enterprise world your modeling environment has to be able to address the broader range of application classes and has to integrate them. You do not want a silo'd environment; a SOA environment is all about sharing and reuse. Your models have to be able to import, export, capture, forward generate, reverse engineer, and report between the common implementation techniques of service-driven, composite, event-driven, mobile, and federated systems using today's integration protocols.

To Tie It All Together

Business Process Modeling, Data Modeling (with conceptual and physical data models, data warehouse models, and data movement through the information liquidity model), Application Modeling with UML (all diagrams for UML 2.0), XML modeling and Free Models (a semantic-free diagramming and drawing facility that can be adapted to document ANY notation desired) are all used to built applications today.

Requirements should be attached or linked to any elements of any models, with multiple requirements documents tied to multiple models simultaneously for complete requirements traceability and visible as a document or a matrix. Models should be used to round-trip engineer to process engines (BPEL engines), databases, application servers as well as object-oriented development languages including VB, .NET, C#, and Java. By using patterns and templates, you can take a model-driven approach to development on J2EE, .NET and Web Services. By using techniques like object/relational mapping and data source mapping as well as integrated metadata management, you can link and synchronize all the models together. Changes that occur in one model can be communicated effectively and easily as change requests to any other model type to ensure a complete, cohesive, and consistent response to change throughout the project team, and throughout the enterprise. With your common metadata repository, you have a secure environment to manage, share, and collaborate on modeling projects.

SDLC

Modern software development systems are usually developed using model-driven methodologies and processes. The nice thing about comprehensive modeling tools is that all the stakeholders throughout the SDLC (Software Development Lifecycle) have their own view into the metadata or information about the system to be developed. This common detailed definition of what must be built to meet the customer's needs is how development teams can be productive and not waste time because of misunderstandings or because one expert didn't pass some information on to another (Figure 2).

- End users and business analysts have a business-centric view into the system that captures information about requirements, goal, ands conceptual business processes.
- IT management and enterprise architects have detailed functional models, more technical but not a code-level view of system components, hardware, and software deployment details, and shared application components.
- Data architects and DBAs have conceptual data models, physical data models, and the DBMS-specific artifacts necessary to implement the data structure and the services necessary to support the processes being automated or implemented.
- Application/system architects and application developers have their view into the use cases, sequences of events, and objects that have to be implemented to develop the application code and the services necessary to codify the detailed business process.

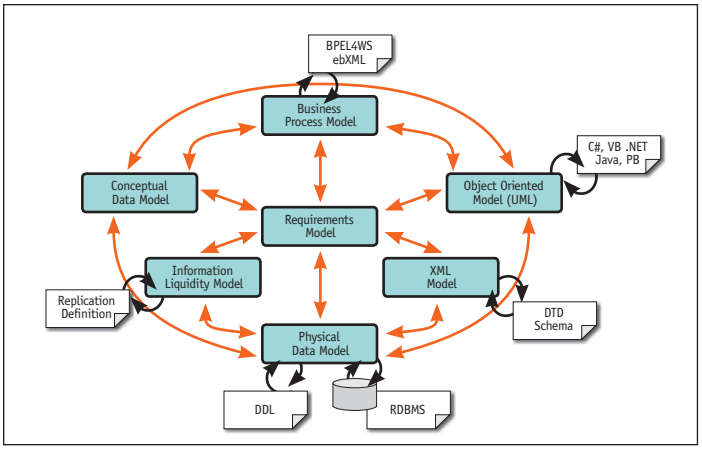

Figure 1: Sybase's view of modeling

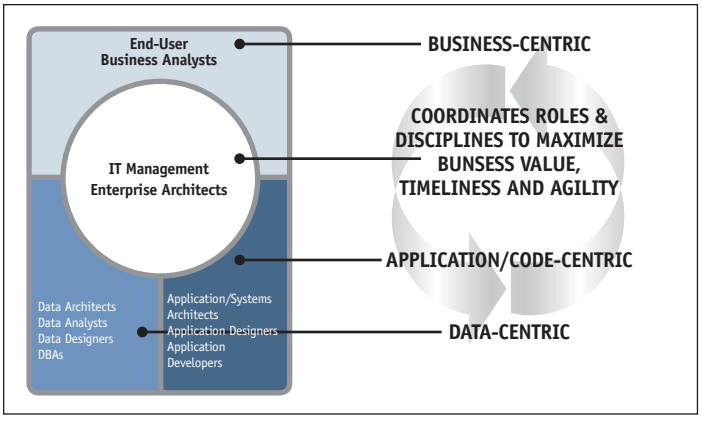

Figure 2: Players in SDLC modeling

Where the real challenge comes in is when there's change: change in requirements, change in business model, change in technological capabilities (new hardware or software standards) – or change in understanding the existing requirements. If we can become more effective and more efficient in coordinating the communication of that change between business and IT professionals, we can increase the agility of our IT development efforts, and so increase the agility of our business. As the team moves through the software development lifecycle, the business system model becomes more and more detailed as each phase of design adds more to the information about what's to be built through adding more diagrams and more descriptive text to the "model"...and in some cases, the code to be generated.

There are many different applications and application components to be built and implemented these days. It may mean creating a new Web application or new client/server application, improving an existing application to fit changing business requirements, modifying an existing application, or creating new application components to support a SOA. Despite the kind of application or computing infrastructure, there are some common tools and methodologies that can be used in its design and development.

Figure 3 shows typical development phases mapped to model deliverables, i.e., the type of model you might expect to result from the discussions held by designers, architects, and business experts in those phases. The process starts with the team defining and capturing the high-level business requirements and goals and using a high-level business process model to refine the functionality to be implemented by the system.

The information gets further refined into models that describe the functionality (in UML notation) and the data (database schemas). At design, the interface where the application objects call the data tables is often done using object/relational mapping that defines what objects are dependent on what data entities/tables and then the code is created or generated out of those more detailed specification models.

Not all applications will need all these methodology steps, perhaps some applications may not need UML sequence diagrams to be created, and perhaps not all programmers need all the automated tools. The experience of the design and development team will dictate which development process and what toolset is most appropriate for the problem at hand. Typically each project or effort defines the specific engineering process the design and development teams will use.

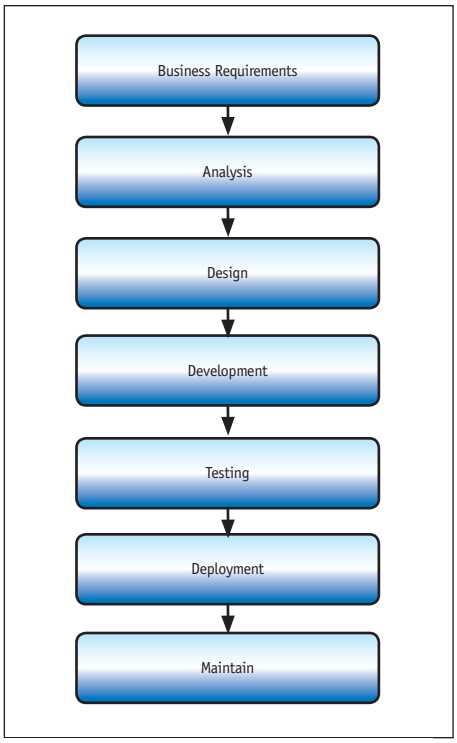

Figure 3: Typical application development phases

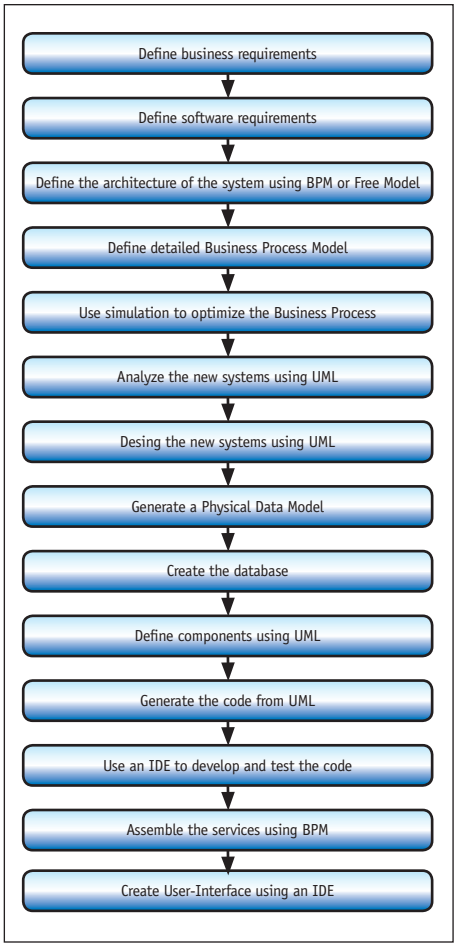

Figure 4: Service-oriented development best practices

Figure 4 shows the models that could be best utilized in developing services

A requirements model is best at defining user goals, organizational requirements, and software requirements.

Use a high-level business process model to define business requirements and link the individual processes and resources back to the requirements. Business process modeling tools often have simulation capabilities so you can see the impact of automating or speeding up a specific process or use case.

Use UML models such as use cases, object definitions, class diagrams, sequence diagrams, and state charts to analyze and design the application.

Define data movement, data sharing, or data synchronization needs.
Generate your relational data model for the database from a conceptual data model or generate non-relational stores and related access methods as XML schemas from UML object or class models.

Use a physical data model to design and optimize the database characteristics for the specific RDBMS you're implementing.

Depending upon your protocol or SOAP, define your communication schemas in XML or WSDLs and discover external UDDI registries.

Develop components and services for processing logic in business process management engines or application servers using a specific Integrated Development Environment (IDE).

Develop a user interface using a related IDE from model-generated stubs.

So by now we should all understand why modeling is important.

Now For Some Specifics

Let's start with a definition: A process is a group of activities, which when performed together, add value for a stakeholder and all inputs and outcomes are defined. When we put the word business in front of process we get: A business process, which is a group of activities that when performed together add value for a stakeholder and the all inputs and outcomes defined constitute the business.

From a SOA perspective, a business process includes people, business services, and

some sort of process management that manages the flow of work activities. A business process model (BPM) is a model that provides a description of the people and business logic and rules of a business process from a functional point of view.

A model is both the diagram and the descriptive text that illustrates and describes all the information and actions of a process from beginning to end

Business process analysts and architects generally use a business process model as an information gathering tool, a simulation tool, and documentation. Its purposes are two-fold:

1. **Process Improvement:** Effectively measure the value added by a company's business processes, which helps companies remain competitive in the face of technological changes and increased competition. A BPM is the focal point around which business operations can be improved and working with a model increases understanding of a business and helps identify opportunities for improvement.
2. **Application Development:** To document and understand current business processes and to help focus on the business processes that an organization performs that add value for stakeholders. To benchmark existing business processes as a basis for business process improvement and to develop a common understanding among customers, developers and end users of the organization and its processes during systems development.

A business process model can be key, when doing an impact analysis of changing a process, expanding a process, or making a systems change. When an analyst is creating or modifying a business process model, regardless of whether the goal is to assist the business folks in investigating the potential for business improvement/re-engineering or for defining the business for application development purposes, the methods the analyst uses to document the information is the same.

They describe the workflow of a process, identify the business actors (or organization units) and resources necessary for the processes to happen, describe interactions and messages that are the communications between organization units, resources, and processes

They identify what the goal or outcome of a process must be, document the business rules that govern the flows, and show decisions to be made and the various "forks in the road" that must be taken based on certain conditions. And, last, but not the least in a SOA environment, they identify processes or resources that seem to occur over and over again. This is our first indication and possibility for a reusable service.

BPM

A business process model comprises a number of visual and non-visual components. Figure 5 shows a fairly basic business process model with most of these components:

- **Process:** A manual or automated action. When a process gains control, it performs the action. Depending on the result of the action, the flow is passed to another process. A process can be viewed as an action to reach a goal and must have one input flow and one output flow at least. A process can also be atomic or composite.
- **Start & End:** Start designates the beginning of a process or composite process and the end represents the termination point of a process. A process may have one or more end points.
- **Flow:** Describes the interaction between two objects. In each process model there is a progression of processes. A flow symbol indicates the next step in the sequence and a flow can apply to labor, materials, or resources. There will be at least one flow in and out of each functional process in a BPM except start and end points.
- **Decisions:** Decisions are used when there's more than one alternate flow from a process. They must have one incoming flow and can have more than one outgoing flow. Each outgoing flow is labeled with a distinct guard condition. A guard condition is a condition that must be satisfied for an associated flow to execute an action. Across all these alternate flows, guard conditions should not overlap so as to avoid ambiguity but they should cover all possibilities.
- **Synchronizations:** A synchronization point is used to rejoin several parallel executions. Flow will not continue until all input flows are complete.
- **Resources:** A resource is similar to a data store and can be many things: data, document, component, and executable. Basically it's a special asset the process can use.

Business rules complement model graphics with information that's not easily represented graphically. A business rule can be a customer requirement, an internal company guideline, or a government-imposed law. Business rules guide and document the creation of a model. For example, the business rule that accounts payable must reconcile an invoice with a bill of lading and original order before paying the invoice can help you graphically represent the process flow in the invoice payment process as well as assign responsibility to the accounts payable organization unit.

Some rules may specify constraints or validation rules. For example, a customer may not place an order for an amount greater than his current line of credit. A sales commission is 2% of a sales order.

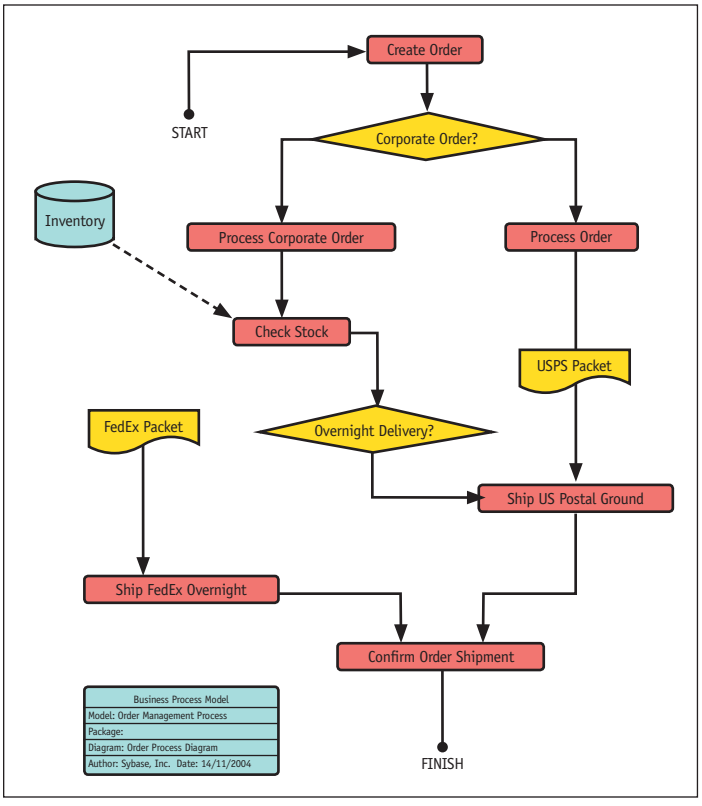

Figure 5: Objects in a BPM

Depending upon the type of business rule, they can actually become codified items such as a cardinality between entities in a data model OR a rule or trigger in database OR a calculation in a Java service.

Most business process models can be associated with a process language (see Figure 6) to generate a workflow for a specific business process and workflow (BPM) engine and most process languages will dictate the visual objects and related icons available for use in your model as well as the type of text that can be captured. The analysis process language is used mostly for business re-engineering or business documentation purposes and not to forward generate a workflow since it contains no implementation details.

If you're creating a business process model to describe the collaboration between business partners, the ebXML language lets you analyze, design, and document business-to-business exchanges (B2B).

If you're designing the decomposition and choreography of tasks at a business level when you already know which platform you're going to use to execute your processes via Web Services then you'd want to use the BPMN language.

If you're designing the process internal to an organization and you're going to generate the process on a BPM engine...BPEL or, for Sybase customers, WorkSpace.

If you are designing the orchestration of Web Services without being linked to any specific platform but want the SOA flavor then use Service Oriented Architecture (SOA) language.

Benefits & Other Models

One of the major benefits of model-driven architectures is that you can have cross-model references and create links between models. Links to a business process model establish process relationships across applications, business units, and functional areas. Links to a requirements model allows for an enterprise-wide view of how processes implement and are derived from specific requirements. Let's now look at two other models that are useful in creating links from a business process: the requirements model and the free model.

The requirements model can capture the textual description and business rules of the business. A requirements document captures the needs, requirements, expectations, and necessary functionality for the systems development lifecycle. This leads to the ability to document relationships between requirements and services and enables a capacity to do an impact analysis all the way back (or forwards) to a specific requirement of changing a service (whether the change is to security, functionality, interface, or location).

Being able to document requirements in a modeling environment enables:

- Links from the requirement to its point of implementation in a CDM, PDM, OOM, BPM, or other model type
- Bi-directional documentation of requirements and their implementation code
- Reporting a traceability matrix between the requirements and their implementation code
- Documenting users, security needs, and glossary terms

A free model (see Figure 7) is a Sybase WorkSpace diagramming tool that has the same link and synchronizing ability as other models. You can use the free model to create different graphics for your specifications, to explain the architecture deployment of your system and applications, the use-case scenario of the applications, the flowcharts, or to define your own method.

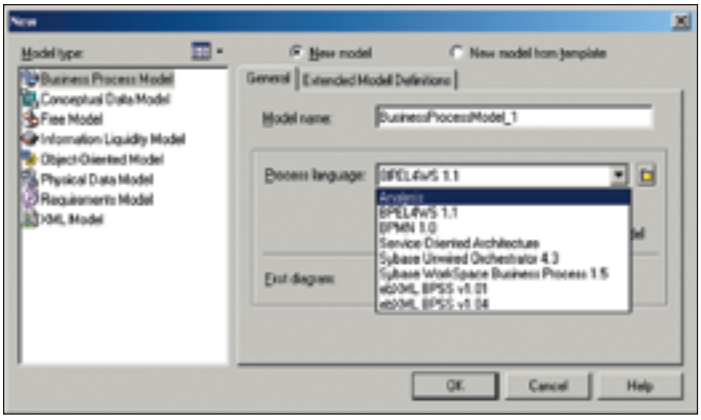

Figure 6: Process languages available in Sybase PowerDesigner

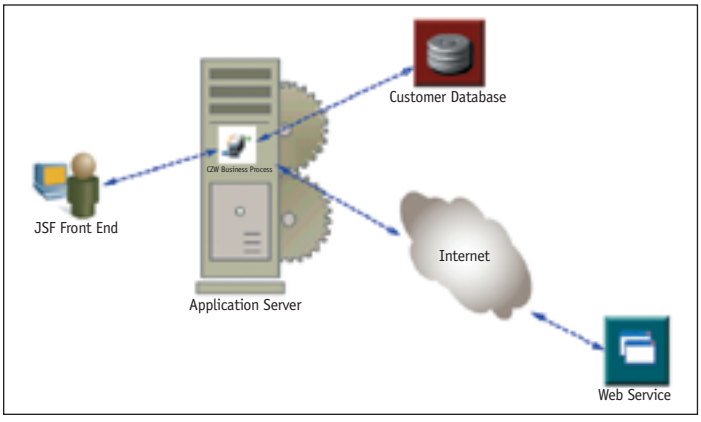

Figure 7: Free model

The mistake most development teams make is to assume that the systems administrators and production support folks will like their application design and code.

The free model lets you include those product folks in your designs to get any issues addressed early. Systems administrators and infrastructure support folks need to know how the application is going to be deployed so they can use this free model as the input document to their process of getting ready to move the application into production, to show the deployment of these services, and to see where applications need to be included on the infrastructure and network.

Conclusion

Everything should start with a model! Model-driven design can drive successful SOA implementations through well-documented specifications and detailed communication vehicles as well as accurate code. The ability to use change impact analysis through linking and synchronizing your models to understand the impact of services is key to a long-term, sustainable plan for your SOA-based computing systems.

Many thanks to my colleague Sheila Wood of Sybase, Inc., for contributing to the writing of this article.

About the Author

In his customer facing role, Ian is very involved with the design, production and testing of Enterprise class UnWired Solutions, that have been implemented using Sybase's UnWired tools for Sybase customers around the globe. In addition, Ian is a dedicated technical expert continually working with Sybase's key partners and clients to enhance the capabilities of the UnWired solutions that Sybase can offer to its customers.

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Enabling Offline SOA Using SDO and ADO.NET

Extending the scope of service consumption to disconnected and occasionally connected environments

WRITTEN BY **BIJOY MAJUMDAR, KARTIK SAI TADANKI, JAVA JYOTHI AND TERANCE DIAS**

Enterprises frequently have to deal with part of their infrastructure that doesn't have the privilege of uninterrupted connectivity. Such system environments designed using Service Oriented Architecture (SOA) need a way to manage uncertain connectivity. SOA as an architectural paradigm depends on a set of services providing business functionality. These services may be distributed over different domains or geographical boundaries. SOA, characterized by independent and self-sufficient services primarily needs to handle the issue of data inconsistency that may result from a disconnect in such environments.

Some SOA business applications mandate systems or devices be in sync with the central business database even when connectivity is uncertain. "Disconnected SOA" or "Occasionally Connected SOA" are designed to deal with such SOA implementations so that they can work in offline mode and can connect to the central server whenever connectivity is available, i.e., they can work seamlessly while taking care of data discrepancies and inconsistencies. This kind of independent and self-sufficient nature of services with business integrity requirements needs intelligence to realize an offline SOA.

Unlike a connected architecture, an offline SOA (disconnected architecture or occasionally connected architecture) demands sophisticated distributed business logic wrapped over the architectural components to interchange data seamlessly while maintaining business data integrity. Such an architecture lets users use such services offline independent of any network latency or dependency or network outage thus increasing overall productivity. Enterprises can benefit from the location transparency that such an architecture provides. For example, the sales people can work when they

are in transit or at a location where there is no connectivity.

Offline architectures have interesting implications for enterprise systems in creating services with non-persistent connectivity. The approach discussed in this article for dealing with common problems in these kinds of architectures is based on distributed data objects that not only carry data but also piggyback the metadata and change history details. This helps in designing distributed disconnected services and, in turn, helps maintain the integrity of the business information in an offline SOA. Invariably we're concerned with offline SOA scenarios involving enterprise services with some kind of enterprise data access. Hence the terms of service and data will be used interchangeably because the primary problem we're tackling in an offline SOA is that of data.

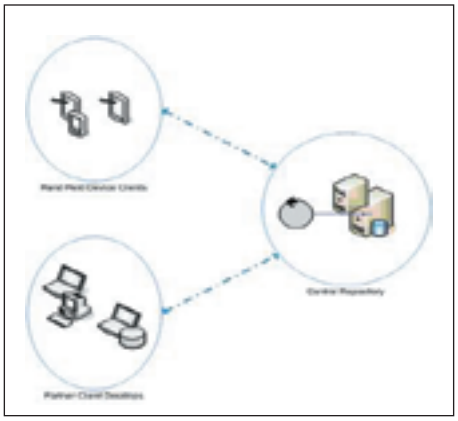

Figure 1: A disconnected environment

Scenarios for Disconnected Environments

Field Sales Force

One scenario for a disconnected SOA is a field sales force, where agents go from place to place invoking enterprise back-end services to while collecting information and passing the information to a central repository.

A typical example is the retail business, where a sales team approaches vendors to take orders. They go to geographically distant places with uncertain connectivity carrying handheld devices. A typical salesperson, at periodic intervals, will update the central repository with the data in his PDA. This opearion needs to be in sync with data collected by other members and consistent data sans redundancy.

Multi-vendor Systems

Another scenario could be an enterprise that has multiple vendors who maintain independent databases, i.e., each vendor maintains its own local data store. These vendors update the data in the enterprise's central repository every fortnight. For example, consider a drug manufacturer that takes orders are at the end of the day from all the sales outlets that use its products.

Challenges Faced

Now the offline (disconnected or occasionally connected) invocation of enterprise services brings with it a few challenges likelost updates due to concurrency. In a disconnected SOA, when a client has read the data, closed the connection, and is working on it, there's only an optimistic lock on the database feeding the service. This means that the client is making an assumption that the data won't be changed by other clients working on the same source, as opposed to a locked version of events; where other clients would be denied access to the resource.

Data Validations

Having called it a disconnected environment, we also have to consider the gap between two sessions; one for when the data is being worked on by the end user and second when the updated data is being stored in the central database. Any inconsistent or insufficient information gathered during this period will be acknowledged only at the point of update. To elucidate, a field agent may collect data from all the prospective users in a certain format. Let's say he sends all his aggregated data once a week. Any data validation against the database or the central repository is known later and would be considered insufficient for the system as a whole.

Strategies/Solution Approach

The ideal solution to these challenges would be to have a technique in place to push the changes automatically or semi-automatically from the server side to the client application. Correspondingly it's also necessary to have a technique at the user end or client end to manage the unforeseen discrepancies that may arise when the updates or inserts or deletes are being carried out at the data source or a business rule kicks in. A general flow or handshake between the server and client will need to take the following steps:

1. Data transfer from the source to end-user systems (this could mean the necessary data or metadata to operate in a disconnected environment).
2. Business data is pushed to the server end in a consistent format when connected to the network.
3. A process needs to be in place to update the data and remove all concurrency inconsistencies.
4. A process needs to be in place to deal with child record conflicts or any trigger-based application conflicts.
5. Business data goes back to the end user or client with minor updates/acknowledgement.

While it might be difficult to articulate an all-encompassing solution to these issues, any disconnected SOA implementation must address the minimum pre-requisites of the architecture like maintaining a local copy of the data and checking data integrity when updating the source to prevent lost updates. We'll discuss in detail a couple of current technologies that will facilitate business integrity in disconnected services.

Below we'll show that ADO.NET and SDO not only help in providing a mechanism for transferring data but inherently manage the key issues of concurrency and version.

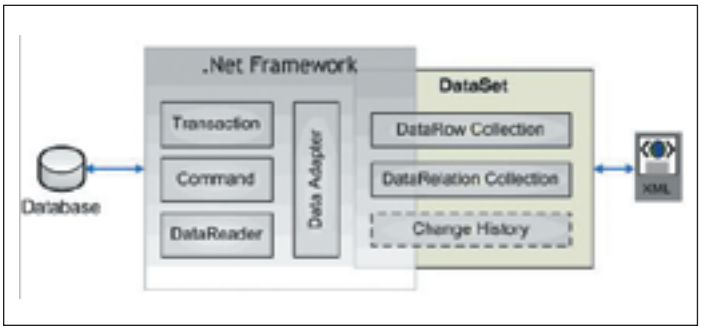

Figure 2: Logical architecture of ADO.NET

While most of the challenges faced in an offline SOA can be handled only at the application architecture level, SDOs and ADO.NET provide basic features like change summary, timestamp, and metadata for addressing some of the data concerns

ADO.NET

ADO.NET is the data access component of the .NET Framework that helps in connecting to databases and manipulating data. The ADO.NET architecture has been uniquely designed to decouple the business logic layer from the data layer by introducing a new data access layer. The core component is the DataSet object: an in-memory cache of data representing a disconnected standalone entity that holds the data. Dataset combines the data tables and data relation object. Together they serve as a miniature disconnected implementation of a data source. ADO.NET objects can play a major role in .NET-based services in solving the concurrency issues across services in a SOA. Some of the features of ADO.NET that might help in disconnected architectures are mentioned below.

Snapshots

When the data is accessed by an application, a snapshot of the database is stored. The data is then retrieved and stored in the dataset. When the application connects to the database to update the data a snapshot of the database is taken again and compared to the earlier one. If both are the same, the updates are committed.

Time Stamping

This is similar to snapshot isolation but here we compare timestamps instead of snapshots. When the application connects to the database, it makes note of the timestamp. The database maintains a record of when different applications/services had access to, retrieved, or updated the data. Before updating the records in the database, the last timestamp on the data and the timestamp on the service are compared. If they're the same, the database is updated successfully.

Metadata and Data Integrity

The dataset contains rows, columns, and *Constraints and Relations* (DataRelation) that combine to form the objects of the dataset. DataRelation allows the service to retrieve the metadata with the data. When changes are made to the data in the dataset, the constraints and relationships are maintained and the data isn't flattened. When the database is updated, the metadata gets updated too maintaining data integrity.

ADO.NET and XML

ADO.NET leverages XML to transfer datasets over the wire. The advantage to transmitting datasets as XML is that any endpoint that is XML-aware can receive and process the dataset, a big advantage in a SOA world. It means that the receiving endpoint doesn't necessarily have to be an ADO.NET component. These days most databases have XML-in and XML-out capabilities that lets ADO.NET to talk to them. Another advantage of XML is that it's not proprietary like the binary protocols for data interchange.

Service Data Objects (SDO)

The concept of service data objects (SDO), a recent standard offered by a few SOA vendors, facilitates the abstraction of accessing data and its manipulation in an SOA world. While ADO.NET as discussed above is meant specifically for databases as data sources, SDO isn't restricted to any particular data source type. SDO is essentially a disconnected architecture in that clients aren't connected to the data source as they perform manipulations. SDOs are already used as a standard for transmitting data in some of the specifications used to realize a SOA-like Service Component Architecture (SCA). They don't repeatedly hit the data sources every time the data is changed. Instead they maintain a Data Graph that holds the data in the form of a graph of interrelated Data Objects. To help represent the data in the form of a graph the SDOs are given the ability to make references to or contain other data objects as their attributes. SDOs have a facility called Change Summary to maintain a record of the changes that were made and so the original state of the data is preserved.

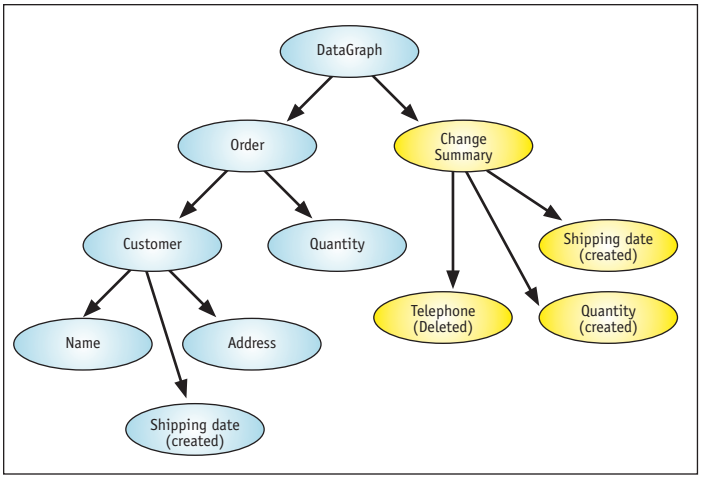

Figure 3: Graphical representation of SDO

Change Summary

The provision of a change summary in the SDO lets the client record the changes that were made to the data and retain the original face of the data (as it was, when it was read) and to restore a graph of the data objects to the state they were in when logging began.

Logging is a feature that can be disabled and the change summary no longer recorded. The change summary indicates the exact changes so, to reduce the amount of data being sent back and forth, only the change summary is sent.

This feature can help avoid the lost updates. Just before writing the data back to the database, the change summary, with its initial data state store, can be used to check to see if the data in the database has been changed while the client was disconnected. If the data hasn't changed the data in the database can be updated without any lost updates.

Metadata

SDO implementations enable services to exchange metadata on the source and enforce a certain level of integrity . SDO also maintains relational integrity through the validations and the rules captured in the metadata. The metadata can be captured from the XML Schema or the relational database or any structured representation. So if employees and departments are related, then an employee referring to a particular department must be updated when the department is deleted otherwise any action will be disallowed.

SDO and XML

When an SDO DataGraph is serialized, it is in XML format. When two services interact via SDO they communicate in XML. This means that any service may be sent an SDO and it should be able to read it and make corresponding objects out of it. This is a major advantage compared to normal Java or C# data, which would be incomprehensible to other platforms.

Object Comparison Support

SDO can also compare two data objects for equality. As discussed a disconnected architecture needs to check the new state of the data with the old state of the data to ensure that it hasn't changed somewhere between the read and the write. This requirement can be addressed by the support for object comparison that SDO provides. SDO provides an Equality Helper Interface that can make shallow or deep comparisons on the data objects. Which means that not only can we tell if there's a difference, but which part of the data changed . There is a Copy Helper Interface that creates shallow or deep copies of the data objects that can save data states at different stages in the change. This is valuable since the change summary can only provide the first and last states of the data.

Limitations and Disadvantages

SDO and ADO.NET can be significant in addressing the data concerns of an offline SOA. However, a few disadvantages and limitations should be underscored.

Bulky Format

The data payloads in SDO and ADO.NET are bulkier than normal data since their format is XML. They also carry more information than just the data. In SDO this is in XML. Such bulky formats can affect network bandwidth and hence SOA performance.

Security

In an offline SOA, distributed data objects have to be transferred over the wire. So the security of data is a concern. SDO and ADO.NET have no inherent features for securing the data over a network.

Conclusion

While most of the challenges faced in an offline SOA can be handled only at the application architecture level, SDOs and ADO.NET provide basic features for handling some data concerns. SDOs are already being used as a standard for transmitting data to realize a SOA-like Service Component Architecture (SCA). Features like change summary, timestamp, and metadata can be key facilitators in addressing data concerns in a disconnected/occasionally connected SOA. ■

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SOA Adoption Models

Ad hoc versus program-based

WRITTEN BY **ALKESH SHAH AND PAUL KALIN**

Enterprises today face increasing IT complexity and cost due to the natural evolution of the application infrastructure. Business is demanding more flexible and sophisticated solutions for discrete business functions that can adapt with evolving market demands and business processes. The need for integration infrastructure has resulted in a legacy of patchwork enterprise application integration (EAI) approaches that have hardwired enterprises for particular business functions and increased IT complexity. However, there is promise that this detrimental trend will reverse through the adoption of Service Oriented Architectures.

The Service Oriented Architecture (SOA) community promotes agility, interoperability, asset reuse and re-factoring and greater information insight. But why are some organizations claiming huge successes and demonstrable ROI while others cite failed SOA projects and question the value of the technology itself? SOA has been around long enough now that we know success is not a question of whether SOA is adopted, but rather, how it is adopted. Adoption approaches vary and will determine the resulting value of SOA to the enterprise.

SOA can provide real dollar savings and increased business opportunity or unplanned (ad hoc) adoption can result into more complexity, increased cost to maintain the levels of SLA, and reduced transparency across applications.

This article discusses the reality of why SOA is already upon us regardless of desire, need, or plan. The value that SOA can yield depends on the maturity of adoption from multiple perspectives: the level of maturity across people, processes, and technology dimensions is directly related to the realized benefits. SOA maturity, however, cannot be achieved accidentally.

Three typical adoption models are observed in the industry today: ad hoc, organic, and strategic. For those enterprises interested in the high value of SOA, this article shows how the ad hoc model cannot be successful. To achieve high value, recommendations are made on how to establish a SOA program through either organic or strategic adoption models.

Business Challenges

SOA is a business-driven technology paradigm that paints a broad brush across several business drivers (see Table 1). SOA is a set of principles, best practices, standards, and tools that finally provide realization of the business mantra – "do more with less – better, faster, cheaper." The competitive and shifting marketplace is putting heavy demands on technology. SOA is evolving out of need, not desire. It is evolving out of the need, not the desire, to address drivers such as those listed in Table 1.

Lower cost to create new product offering and solutions
Improve flexibility of applications to quickly adapt to changing market demands
Improve time-to-market to gain a "first to market" competitive advantage
Improve operational efficiency – more automation – more process support
Greater business insight – the ability to track business and IT measures
Align business and IT – satisfy stakeholders
Improve the quality of information and services
Get better return on existing IT assets

Table 1: Example Business Drivers for SOA

Typical IT departments struggle to address these business drivers with traditional technology approaches. Table 2 lists some common IT barriers that we have encountered in our client engagements. Without an appropriate level of intervention, it will continue to compound and become exponentially worse over time. This will further isolate business and its IT counterpart.

Inconsistent standards and architecture increases maintenance and development costs.
Redundant data across the enterprise causing multiple inconsistent views of information and costly maintenance for structural changes.
Redundant business logic resulting from little functional reuse results in redundant and costly work efforts for addressing business needs.
Low level of functionality reuse resulting in proliferation of redundant code.
Hard-coded business rules throughout diverse code bases.
Point-to-point nature of integrations limits scalability and tightly couples applications resulting in an inflexible "hardwired" solution.
"Workflow" logic untraceable and spread across many disconnected code modules resulting in costly change.
Latency introduced throughout processing causes data mismatch and untimely delivery of information. Complexity is further increased due to reconciliation requirements increasing the cost of maintenance and development and reducing the flexibility of the solution.

Table 2: Typical IT Barriers to Business

SOA will form the underpinnings of the next generation of architectures that will address business drivers and remove many of the IT barriers through reusable, distributed, loosely coupled services that are accessed through stable, well-defined interfaces. The characteristics of SOA are:

- Information is made available through independent and atomic components called services
- Service reuse and consumption is facilitated through a registry where services are described through standard message formats and protocols
- Self-describing messages travel from component to component independent of platform
- Systems and components are loosely coupled — they don't know much about each other, thus provide an opportunity for interchangeability
- Services and composite applications use standard mechanisms for communication wherever possible
- Business applications own as few resources as possible, leveraging shared assets such as schemas, common components, and service libraries fostering common understanding at an enterprise level

SOA is not a single technology stack or a magic bullet. It can be implemented in many ways (e.g., EAI, ESB, Web Application Server, etc.).

While many businesses are struggling with the question of whether or not to adopt SOA, the reality is that adoption is inevitable and probably already happening. SOA has been endorsed by every major software vendor. The once-proprietary black boxes of domain-specific applications are being exposed through open and standard interfaces/services. Middleware vendors, once selling EAI products or application containers, are now marketing SOA platforms or service containers. Even the major database vendors are facilitating service-based data access. Natural upgrade paths of existing IT infrastructure and systems will introduce new service-oriented technologies into the enterprise. While the openness of SOA is a generally positive architecture trait, introduction and integration without proper coordination will yield negative effects.

SOA Adoption Models

We have encountered various approaches that enterprises are taking for migrating to and adopting SOA for their enterprises. We list the following models in this article that we have come across consistently: ad hoc and program-based (organic and strategic) models.

The Ad Hoc SOA Adoption Model

Ad hoc SOA adoption is the project-level adoption of service-oriented technologies on a specific need or tactical basis. There is no central coordination or plan. The results of this adoption model are:

- Each project or initiative benefits the technical advantages of new services at an individual level.
- The technologies are applied inconsistently, which allows for proliferation of bad SOA practices, such as the development of non-standard Web Services, hidden pockets of cost in one-off maintenance, low-level of service reuse, increase in point-to-point Web Services connectivity, etc
- Enterprise reuse can't be achieved and can therefore yield redundant development efforts.
- Increased IT complexity, resulting in reduced agility for responding to business demands
- Potentially resulting in worse condition than the previous status quo.

It's clear that businesses need to invest in a strategy for SOA adoption that will address business drivers, improve existing IT challenges, and avoid the negative impact of unplanned ad hoc SOA adoption. Depending on the organization's goals and level of investment, SOA adoption can be planned in accordance with an overall program.

The Program-based SOA Adoption Model

Program-based SOA adoption allows SOA evolution to be controlled according to an overarching enterprise strategy and goals. This model provides a holistic view and addresses the enterprise from organizational, process, and technology dimensions over time. A planned and directed SOA adoption strategy eliminates the risk of propagating SOA bad practices that will worsen the IT situation. Some key characteristics of a program-based approach are:

- Creates processes and guidelines that support desirable, consistent, predictable, and measurable outcomes for SOA adoption.
- Provides active service portfolio management, including ongoing SOA opportunity identification.
- Promotes SOA best practices and enhances one's ability to adopt new technology paradigm consistently across the enterprise as well as increase SOA ROI
- Provides an opportunity for changes to the organization and processes as learning can be applied to further strengthen the SOA ROI.

We'll consider two program-based SOA adoption models: organic and strategic. Both provide planned and controlled adoption behaviors. The difference in these models is how they are initiated and the pace of adoption.

The Program-based Organic SOA Adoption Model

Organic SOA adoption model requires low investment. It allows:

- Quick understanding and alignment of key business drivers with SOA objectives
- Execution of a prioritized project using SOA principles
- Development of core (base line) processes
- Building foundation technologies that can be used for successive SOA projects.

In an organic adoption model of SOA, one builds a business case from the findings of the initial project. Base line standards, best practices, processes, and organization structure are created and then evolved.

The initial project rarely provides a positive ROI due to the cost associated with additional planning and the SOA infrastructure build-out. However, the organic model shows that incremental benefits will be achieved through SOA on successive projects. SOA does not require a full enterprise implementation to begin to realize value. Investments in the infrastructure can be aligned on a project basis to reduce risk. The value can be realized earlier without a comprehensive SOA strategy.

Figure 1 shows the typical progression of the organic SOA adoption model. The initial project is chosen opportunistically from existing planned projects according to agreed upon criteria. The project is executed with the original scope in mind and a specific business problem is solved. SOA artifacts and processes used on the project are then harvested. Incremental SOA costs are absorbed by the initial project and are recouped by the business in subsequent SOA projects.

The Program-based Strategic SOA Adoption Model

As an alternative to the organic approach, the strategic SOA adoption model is characterized by an initial strategy project to build an enterprise business case for SOA, define a future state, and plan a roadmap for implementation. The future state incorporates not only the technology transformation required to move towards SOA, but also the organizational and process changes as well.

	Strategic Model	Organic Model
First-Year Activities	• Define SOA strategy • Justify the approach through a business case • Model a comprehensive future state > People > Process > Technology • Plan SOA roadmap • Develop enterprise SOA roadmap • Vendor selection/install for SOA core components based on enterprise needs • Create governance structures • Build out the core architecture • Implement new organizational structures and associated processes • Develop first-use applications to validate the technology and the ROI • Extend based on the roadmap	• Define SOA objectives • Envision a high-level future-state architecture • Select initial SOA project • Build core architecture components based on application requirements, leverage existing IT investments • Define and implement patterns for reuse for the next application • Measure benefits and justify the approach through a business case • Implement the next wave of the architecture components to extend to the enterprise
Strengths	• Strong business & IT alignment • Enterprise-class architecture defined and built out • First adopters validate the enterprise approach	• Speed to market • Minimize the upfront investment and risk • Experience with tools helps design the enterprise architecture • Absorb the strategic cost within the project budget
Weaknesses	• Higher front-loaded cost, but usually a stronger ROI • Deferred use of SOA on projects – opportunity for continued proliferation of problematic architecture practices.	• Risk of silo'd and redundant architectures that don't integrate well • Difficult to extend to the enterprise • Governance model not defined or built

Table 3: At a Glance: Program-based SOA Adoption Models

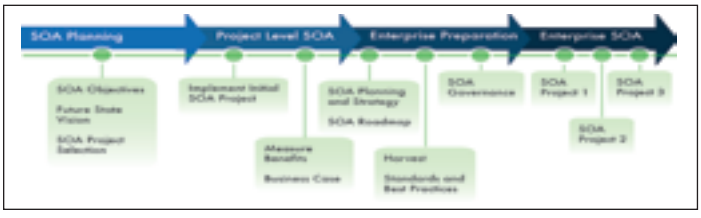

Figure 1: The organic SOA adoption model

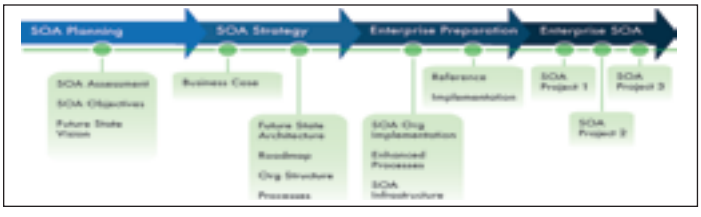

Figure 2: The strategic SOA adoption model

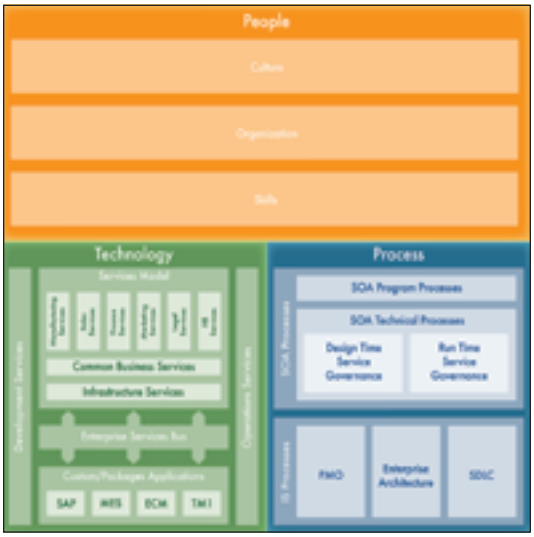

Figure 3: Strategic SOA defines a model for people, processes, and technologies before projects leverage SOA

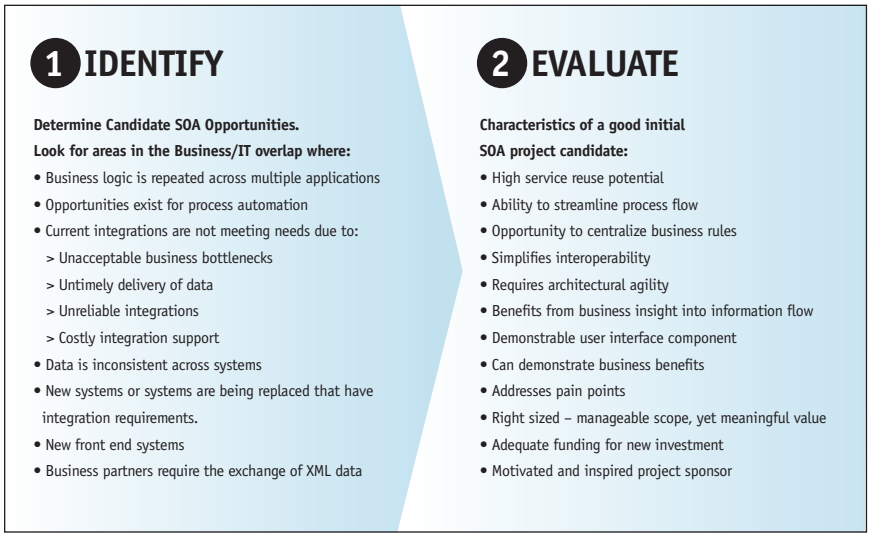

Figure 4: Suggested identification and evaluation criteria for SOA adoption

Organizations adopting SOA through a strategic model build out a supporting infrastructure for enterprise SOA with a reference implementation that demonstrates the recommended use of standards and best practices.

The roadmap of strategic SOA is based on a comprehensive assessment of the enterprise and defines SOA projects over a three- to five-year timeframe. It takes into account all the dimensions of an enterprise: people, processes, and technology (see Figure 3). NOTE: We need to redraw this visual differently. It was done for PMUSA with ToPCoder).

SOA Adoption Recommendations

While there are clear tradeoffs between the organic and strategic SOA adoption models, there are four key adoption recommendations for any successful program-based SOA. They are:

- Align SOA objectives with business drivers
- Selectively determine SOA adopters
- Identify and address organizational barriers to adoption
- Define and measure success

Align SOA objectives with business drivers

Since SOA is a set of best practices and related standards that can be applied uniquely on each implementation, implementation can produce a variety of benefits. There's a risk of misfiring or misinterpretation when SOA objectives aren't clearly aligned with business drivers. To be effective, SOA implementation objectives have to be in alignment with the enterprise imperatives for both organic and strategic adoption. In both organic and strategic SOA adoption, SOA objectives need to be documented that can:

- Support the business case for SOA
- Align the architecture with the needs of the business
- Act as a reference for developing a future-state reference architecture
- Prioritize the approach for potential projects and a SOA roadmap

SOA strategy should begin by understanding the enterprise imperatives – a successful business plan takes the external environment, business and IT strategy, and current and planned projects into account. SOA objectives are best identified collaboratively in a workshop environment with key SOA stakeholders from business and IT leaders along with user communities. With enterprise imperatives identified, SOA objectives can be well articulated and prioritized across functional units of the value chain.

Earlier we showed you typical business drivers for SOA (Table 1). SOA objectives for the enterprise can be an extension of these kinds of drivers prioritized and aligned with the enterprise imperatives. For example, the first business driver – *lower cost of IT – simplify the IT infrastructure* – can be the basis of a SOA objective and can be extended to state – *lower cost of IT – simplify the IT infrastructure by reducing the data redundancies across customer-oriented systems.* An SOA objective should relate to a particular business strategy, but not prescribe an implementation approach.

Selectively determine SOA adopters

A key differentiator between program-based and the ad hoc approaches is the methodology used to determine which projects should adopt SOA based on a strategy rather than leaving SOA adoption up to each individual project or department. With the organic approach, an initial project is selected opportunistically – after a quick survey of planned projects, a reasonable candidate is chosen based on subjective evaluation. In contrast to this, the strategic approach demands an extensive evaluation, with weighted criteria, and will produce a more objective evaluation scorecard based on agreed upon criteria. Within any organization, criteria for project selection will be unique to the business. Figure 4 suggests a two-step process for identifying and evaluating SOA opportunities.

Address organizational barriers to adoption

There is no generic SOA organizational structure that will meet the needs of every business. It's clear, however, that traditional IT organization structures aren't well suited to support SOA. Whether the organizational structure is functional, project-based, or matrix, traditional IT organizations can impose the following barriers to adoption:

- Silo alignment of applications, processes, and organizational structure
- Weak architectural governance
- Orientation to project goals, not long-term solutions
- No incentive for strategic investment
- Teams oriented around project lifecycles as compared to service lifecycles

When evaluating a particular organization and associated processes SOA implications should be considered broadly:

- How business problems and requirements get defined
- How solutions are envisioned
- Finally, how they are assembled, deployed, and monitored

SOA touches every aspect in this spectrum and will therefore impact the processes of PMO, enterprise architecture, SDLC, ITIL, and IT/architecture governance.

When planning new roles and responsibilities, a SOA strategy will involve multiple tiers of involvement including but not limited to:

- **Stakeholder leadership** – a senior-level management group that initiates and drives the SOA vision and strategy
- **Strategy execution** – promotes the successful adoption of SOA across the enterprise and helps the organization see ROI from the SOA strategy. At a high level, they oversee strategy, development, operations, and governance
- **Technology** – owns SOA standards and best practices and provides architecture leadership for the organization. Development of standards and guidelines. Responsibility for all centralized components of the SOA
- **Governance** – review boards that enforce SOA architecture governance policies on a project-by-project basis and is integrated with entire SDLC.

Whether these responsibilities are centralized or distributed – whether they are part of one or many organizational units – depends on the SOA objectives, scale of adoption, and existing organization model.

Organic SOA adoption will address organizational barriers in a different way than the strategic approach. The organic model puts heavy emphasis on technology and project-level architecture governance early in the adoption cycle. Strategy and overall leadership will evolve with each successive project as learning is applied on how SOA will best benefit the organization. By contrast, the strategic approach involves greater effort in organizational transformation. Emphasis is placed first on building out the leadership and strategic value of the SOA organization to support the long-term plan.

Define and Measure Success

A SOA program should be assessed and monitored through well-defined performance measures based on internal baselines and/or industry benchmarks. The strategic component of the SOA organization should be tasked with selecting, monitoring, evaluating, and maintaining performance measures and targets. Ideally, the performance measures are derived from SOA objectives that are measurable.

Measures can be established across various aspects of the enterprise including business, financial, quality, process, timeliness, pervasiveness, and compliance. Table 3 lists examples of measures across these aspects.

Business	**Process**
• Market share	• Process cycle time
• Time-to-market	• Process duration
• Customer satisfaction	• Process failures
	• Number of process occurrences
Financial	
• ROI	**Timeliness**
• Cost savings	• ESB performance
• Overall IT development and maintenance costs	• Problem resolution time
• Service enhancement/change request costs	• Recovery time
• Initial service development costs	• Recommended training time
• License costs	• Degree of automation/reduced latency
• Revenue growth	• Project performance metrics – e.g., on time delivery of ESB projects
• IT budgets	
• Project costs	**Pervasiveness**
	• Number of services
Quality	• Number of trained resources
• Availability/uptime	• Degree of service reuse
• Data accuracy/error rate	• Number of departments using central SOA hosted services.
• Number of problem events	
• Service-level measures	**SOA Governance**
• Lines of code (both consumer-side and producer-side)	• Compliance
• Ease of integration (consumer-side qualitative measure)	• Governance exceptions
• Quality of documentation (consumer-side qualitative measure)	• Number of escalations

Table 3: Example performance measures for SOA

Conclusions

SOA provides a powerful set of technologies and approaches that have the potential to make IT more effective in meeting the needs of business. But grassroots technology-driven SOA initiatives run the risk of proliferating a new patchwork of EAI hardwiring that satisfies only short-term project-level needs. This will complicate the overall IT landscape. There are benefits to SOA, such as enterprise reuse and business alignment, that cannot be achieved effectively through such an ad hoc approach.

A number of good organic and strategic adoption models exist. The key to success is controlled and planned growth that includes involving the business. A good starting point for program-based adoption is to identify the SOA maturity level of the enterprise and then create a SOA strategy that aligns SOA technology adoption with business priorities.

Getting started with a SOA program can be accomplished with minimal investment. A quick assessment can identify and prioritize SOA opportunities. This will give the business a handle on how SOA is currently being adopted. It will also provide an understanding of the degree of SOA standardization and identify new opportunities to collaborate across departments and projects. This will help an organization establish general SOA goals and commit to an adoption model.

For those organizations that have already established a compelling case for enterprise SOA, a more substantial investment can be made in developing a full SOA strategy including a complete opportunity assessment and analysis, future-state architecture, and adoption roadmap.

Whether organic or strategic adoption is the course, an organization should be prepared for service transformation. Agility, interoperability, business service standardization, and reuse – some of the key tenets of SOA – don't happen by accident and require an organization to provide the roles, responsibilities, and processes to drive SOA effectively. Besides organizational structure, assess SDLC, PMO, enterprise architecture, and governance processes to determine how they factor in SOA. ■

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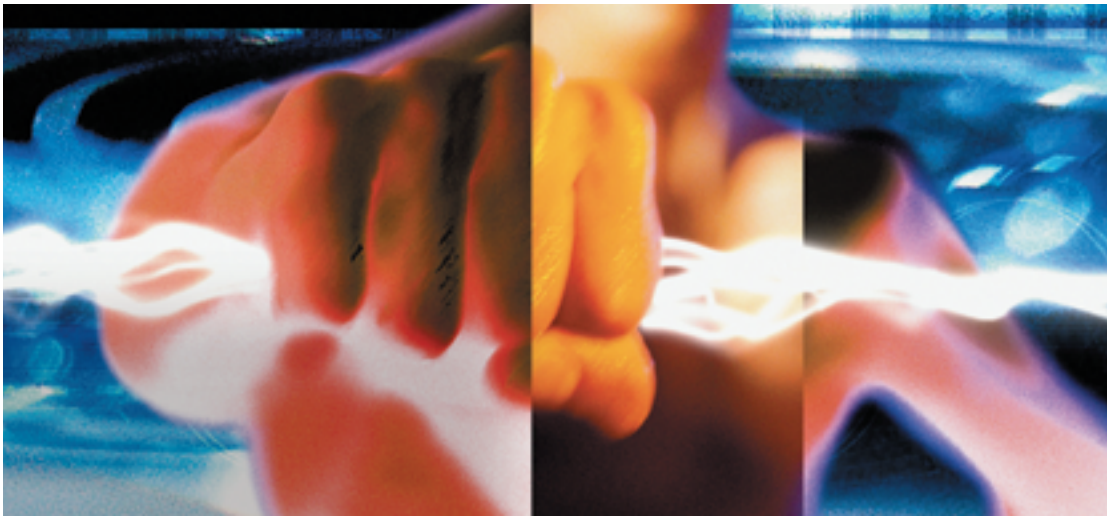

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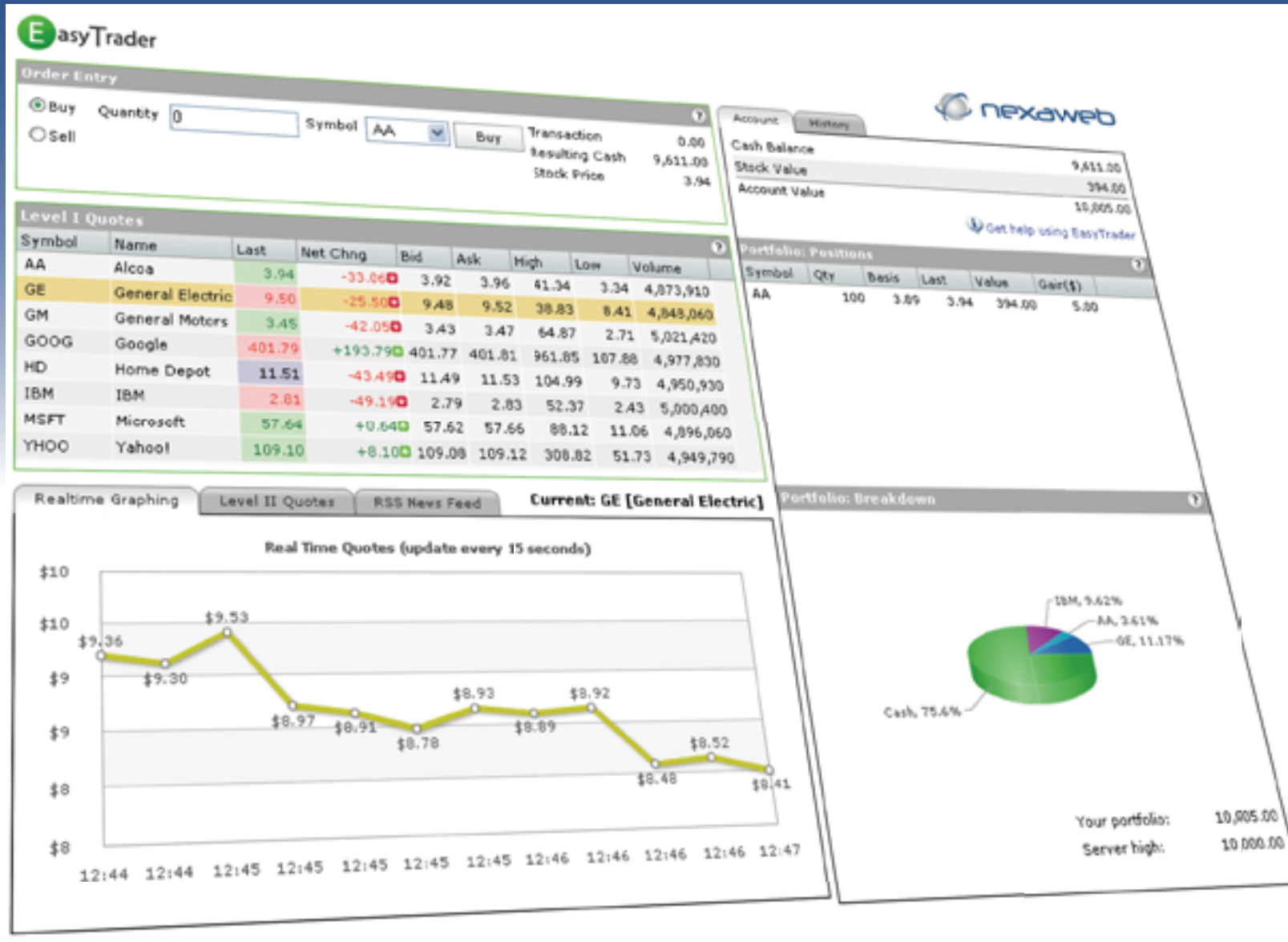

SOA promised benefits for both IT and end-users. But the inability to expose SOA to the end-user in a way that enhances their experience and decreases application delivery has left the promise unfulfilled… until NOW!

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Welcome Letter

GREETINGS AND WELCOME TO NEW YORK!

SOA has experienced a dynamic evolution from Web services and enterprise application integration in recent years. The role of Enterprise Open Source in this evolution has been a key driver of this growth, and now companies are truly discovering the benefits of Virtualization in deploying loosely coupled applications throughout their enterprise SOAs as they strive to become ever more agile and competitive. In response to this, we have assembled the most diverse and powerful group of panelists in the world to deliver the most up-to-date information about SOA, Enterprise Open Source, and Virtualization.

So if you need to know how Web applications are being designed, developed, and deployed, there is no better place for you to be than at the Roosevelt Hotel in New York these next three days!

The content is diverse, yet unified by the need for enterprises of all sizes on a global basis to analyze, adapt, and benefit from the best-in-class technologies and best practices offered by the wide range of companies that deliver products and solutions for SOA, Enterprise Open Source, and Virtualization. Here are the seven content-rich tracks we're delivering over the next three days:

- *Web 2.0/AJAX and SOA*
- *Real-World SOA*
- *SOA Technology Track*
- *Virtualization*
- *Enterprise Open Source*
- *Selected Hot Topics*
- *Interop, Standards & Services*

Search beneath these general titles for the incredible array of specific sessions, and attend whatever sessions appeal to you the most. You will find a uniquely powerful line-up of highly talented presenters delivering information that will truly be invaluable to you as you move forward with developing and improving your IT infrastructure. And, in addition to our seven content-rich session tracks, we have developed separate Power Panels on SOA, Enterprise Open Source, and Virtualization. You can listen to the experts in highly interactive sessions that will be carried live on SYS-CON.TV.

Whether you are here as an attendee, exhibitor, sponsor, analyst, or press, please accept my warmest welcome on behalf of the entire SYS-CON Events team. We've put our passion and energy into producing this sellout event, and we sincerely hope this will be a very memorable three days for you. Please feel free to interact with any SYS-CON Events team members throughout the conference to share your opinions and discuss what you are doing with SOA, Enterprise Open Source, and Virtualization. Your input is not only valued, but is a key driver to enable us to continue to deliver the world's best content on the world's most exciting technologies.

Cordially,
Roger Strukhoff
Conference Chair

SCHEDULE OVERVIEW

MONDAY, June 25

1:00 - 1:30pm	Registration
1:30 - 2:15pm	Opening Keynote: Dr. Hal Stern of Sun Distinguished Engineer & VP, Global Systems Engineering
2:20 - 3:05pm	Technical Sessions
3:10 - 3:30pm	Break
3:35 - 4:05pm	Virtualization Power Panel
4:05 - 4:55pm	Presentation & Demo by IBM
5:00 - 5:45pm	Technical Sessions
5:45 - 7:00pm	Welcome Reception

TUESDAY, June 26

7:00 - 7:30am	Registration
7:30 - 8:15am	Opening Keynote: Jeffrey M. Nick Service-Oriented Infrastructure in a Web 2.0, Virtualized World
8:15 - 9:05am	TBA
9:10 - 9:55am	Technical Sessions
10:00 - 10:50am	Keynote: David Greschler Virtualization Beyond the Datacenter
10:50 - 11:30am	Coffee Break / Expo Floor Open
11:35 - 12:05pm	Presentation & Demo by Laszlo Systems
12:05 - 12:35pm	Presentation & Demo by webMethods
12:40 - 1:25pm	Technical Sessions
1:30 - 2:30pm	Lunch Break / Expo Floor Open / TBA
2:40 - 3:10pm	EOS Power Panel
3:15 -4:00pm	Technical Sessions
4:05 - 4:55pm	TBA
5:00 - 5:45pm	Break / Expo Floor Open (sponsored by IBM)
5:50 - 6:35pm	Technical Sessions
6:35 - 7:20pm	Technical Sessions

WEDNESDAY, June 27

7:00 - 7:30am	Registration
7:30 - 8:15am	Opening Keynote: Rob Levy SOA & Web 2.0 Through the Lens of Society: the Consumerization of the Enterprise
8:15 - 9:05am	TBA
9:10 - 9:55am	Technical Sessions
10:00 - 10:50am	TBA
10:50 - 11:30am	Coffee Break / Expo Floor Open
11:35 - 12:05pm	TBA
12:05 - 12:35pm	TBA
12:40 - 1:25pm	Technical Sessions
1:30 - 2:30pm	Lunch Break / Expo Floor Open / TBA
2:40 - 3:10pm	SOA Power Panel
3:10 - 4:00pm	Technical Sessions
4:05 - 4:50pm	TBA
5:00 - 5:45pm	Break / Expo Floor Open (sponsored by IBM)
5:50 - 6:35pm	Technical Sessions
6:35 - 7:20pm	Technical Sessions

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Parasoft is the leading provider of innovative solutions for automating software test and analysis and for establishing software error prevention practices as an integrated part of the software development lifecycle. Parasoft products and services enable software development and IT organizations to significantly improve visibility and control over the quality, costs and schedules of their software projects through the practice of Automated Error Prevention (AEP). Parasoft's easy-to-use, scalable and customizable software error prevention solutions span the complete software development lifecycle and automatically test complex software systems from all relevant perspectives, from the Java, C/C++, and/or .NET code at the implementation layer, to the Web service / SOA at the messaging layer, to the Web front end. Parasoft has more than 10,000 clients worldwide, including Boeing, Cisco, Disney, Ericsson, Fidelity, IBM, Lehman Brothers, Lockheed, Lexis-Nexis, Sabre Holdings, SBC and Yahoo. Founded in 1987, Parasoft is a privately-held company headquartered in Monrovia, CA.

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www.webmethods.com

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Active Endpoints is the leading provider of SOA orchestra enable organizations to build and deploy composite, process-driven information systems based on WS-BPEL, the SOA orchestration standard. From open source to mission-critical deployments, Active Endpoints allows users to quickly adapt to evolving customer demands by reducing the cost of integration, leveraging infrastructure investments, and enabling the sharing of business processes with customers, partners, and suppliers. More ISVs, financial services, government, telecommunications, high technology, and retail organizations use Active Endpoints' solutions than any other BPEL technology.

WSO2
wso2.com

WSO2 is an open source middleware company founded by pioneers in Web services and of members of the Apache Software Foundation Web services community. We deliver a new, entirely open source middleware stack that is optimized for Web services and SOA and built on Apache Axis2. WSO2's first products are the WSO2 Web Services Application Server (WSAS) and WSO2 Enterprise Service Bus (ESB), which are built on the WSO2 Web Services Framework. The company maintains operations in the United States, United Kingdom and Sri Lanka.

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ajax.sys-con.com

The terms on everyone's lips this year include "AJAX," "Web 2.0" and "Rich Internet Applications." All of these themes play an integral role at ***AjaxWorld***. So, anyone involved with business-critical web applications that recognize the importance of the user experience needs to read this uniquely timely publication — especially the web designers and developers building those experiences, and those who manage them.

BZmedia
www.bzmedia.com

BZ Media LLC is a privately held, high-tech media company based in Huntington NY on Long Island's beautiful north shore. BZ Media was founded in 1999 by veterans from Miller Freeman, CMP, IDG, Newsday and Ziff-Davis.

ColdFusion Developer's Journal
coldfusion.sys-con.com

ColdFusion Developer's Journal is the premier magazine aimed specifically at Webmasters and Web Application developers using the fast-evolving comprehensive Internet platform offered by Adobe based around ColdFusion.

.NET Developer's Journal
dotnet.sys-con.com

Acknowledged as the world's leading independent, unbiased developer reference source for .NET developers, ***.NET Developer's Journal*** features technical insights into every aspect of .NET including the server side, the desktop, and mobile devices.

Eclipse Developer's Journal
eclipse.sys-con.com

Eclipse Developer's Journal is the only monthly source of quality Eclipse information.

Enterprise Open Source Magazine
opensource.sys-con.com

EOSM offers a regular heads-up on what companies are doing in the Linux and open source space - breaking news, insightful hard-hitting commentary, interviews with industry leaders and visionaries, no-holds-barred criticism, and much more.

Extension Media
www.extensionmedia.com

Extension Media publishes 20+ resource catalogs, websites and email newsletters for IT professionals and software developers covering the industry's important platforms and technology areas. Publications include resource catalogs covering Security, Grid and Cluster, IBM Information Management, Storage, VoIP and IP Telephony, Enterprise Linux, Windows® Server and Business Intelligence.

GoingToMeet
www.goingtomeet.com

Conference Directory

Information Storage+Security Journal
issj.sys-con.com

The major infosecurity issues of the day - identity theft, cyber-terrorism, encryption, perimeter defense, and more - come to the forefront in ***Information Storage + Security Journal***, the storage and security magazine targeted at IT professionals, managers, and decision makers.

IT Solutions Guide
itsolutions.sys-con.com

The ***IT Solutions Guide*** offers technologies from the world's top solution providers. The ***IT Solutions Guide*** reflects the expansion of IT beyond mere Information Technology to Internet Technologies and Infrastructure Technology. Familiarity with the top solutions showcased in this guide is essential for IT professionals.

ITtoolbox
www.iTtoolbox.com

ITtoolbox is an online community, enabling peers to share professional knowledge about information technology. Since 1998, ITtoolbox has helped professionals make IT decisions and stay current in the rapidly changing IT market through peer collaboration.

JDJ
java.sys-con.com

JDJ is the premier independent, vendor-neutral magazine serving the information needs of the entire community of developers in the Java programming language and the Java platform. Crammed with Internet- and Web-related features, regular columns by established Java gurus, "how-to" programming tips, product reviews, all the latest industry news.

Linux.SYS-CON.com
linux.sys-con.com

Linux.SYS-CON.com is aimed at helping managers who want to gain the economic benefits of open source software like Linux, but don't know how to manage the risk associated with making the change.

Methods & Tools
www.methodsandtools.com

The terms on everyone's lips this year include "AJAX," "Web 2.0" and "Rich Internet Applications." All of these themes play an integral role at AjaxWorld. So, anyone involved with business-critical web applications that recognize the importance of the user experience needs to read this uniquely timely publication-- especially the web designers and developers building those experiences, and those who manage them.

PowerBuilder Developer's Journal
powerbuilder.sys-con.com

PowerBuilder Developer's Journal has been covering the evolution of PowerBuilder for over 14 years and has consistently provided quality content.

SDTimes
www.sdtimes.com

SD Times is the only IT trade newspaper specifically written for the software development manager. The broad-based IT newsweeklies abandoned this reader a decade ago. Now you can reach them directly, efficiently and inexpensively in SD Times.

SOAWorld Magazine
soa.sys-con.com

SOAWorld Magazine is the premier publication addressing the technical and strategic depth of SOA and Web Services. Its target audience is anyone who wishes to design, administer, sell, or use Web Services - from the developer, to the ISV, to the CTO, and to the end user.

Software Test & Performance
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Web Designer's & Developer's Journal
webddj.sys-con.com

Targeted at the professional developers and designers who use the award-winning Macromedia MX product family to build Web sites and applications, ***WebDDJ*** is written by industry experts and features tutorials, success stories, sneak previews, programming tips, and more.

WLDJ
weblogic.sys-con.com

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WebSphere Journal
websphere.sys-con.com

WebSphere Journal is the premier publication for those who design, build, customize, deploy, or administer IBM's WebSphere suite of software products for developing, testing, and deploying interoperable e-business applications.

Wireless Business & Technology
wireless.sys-con.com

Wireless Business & Technology is the world's leading publication tracking Wireless in Action rather than wireless in theory. Articles and features concentrate on getting beyond the marketing hype and drilling down to the here-and-now prospects of ROI from the deployment and implementation of real-world wireless solutions.

XML-Journal
xml.sys-con.com

XML-Journal is the world's leading online resource for Internet technology professionals involved with the worldwide development and implementation of XML, the universal format for structured documents and data on the Web, and its fast-growing family of related specifications (XSL, XSLT, ebXML, VoiceXML, etc).

ZapThink
www.zapthink.com

ZapThink is an IT advisory and analysis firm that provides trusted advice and critical insight into the architectural and organizational changes brought about by the movement to Service-Oriented Architectures, Web Services, and Enterprise Web 2.0. We provide our three target audiences 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.

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OASIS
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OASIS (Organization for the Advancement of Structured Information Standards) is a not-for-profit, international consortium that drives the development, convergence, and adoption of e-business standards.

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The SOA Consortium is a new SOA advocacy group comprised of end users, service providers, and technology vendors, committed to helping the Global 1000 successfully adopt SOA by 2010.

Exhibitors

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www.faratasystems.com

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Fiorano Software Inc
www.fiorano.com

Fiorano Software Inc, a US Corporation headquartered in Silicon Valley, CA. Fiorano is a leading provider of enterprise class business integration and messaging infrastructure technology. Companies use Fiorano products to develop real-time competencies, improving operational efficiencies and business performance by deploying flexible business processes spanning multiple applications and platforms and partners. Fiorano's distributed, event-driven and service oriented architecture sets a new paradigm in performance, scalability, simplicity, and affordability. With Fiorano, customers can focus on their core competencies, realize an immediate ROI and need no longer grapple expensive, unwieldy alternatives. Fiorano's technology provides ease of use and flexibility powering a variety of businesses from Medium Enterprises to Global leaders and Fortune 500s such as Boeing, British Telecom, NASA, Schlumberger, Quicken Loans, Federal Reserve Bank of New York , Lockheed Martin and McKesson among others. For more information about Fiorano Software Inc, visit www.fiorano.com

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www.itko.com

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Layer 7 Technologies
www.layer7tech.com

Layer 7 Technologies is a leading provider of XML security and networking infrastructure for SOA and Web 2.0. The award-winning SecureSpan family of XML appliances and gateway software address the security, performance and complexity challenges of deploying and maintaining production Web services. Modern service-oriented application integration models and Web-oriented application delivery models depend on effectively addressing these issues inherent in sharing Web services with other applications. Layer 7 Technologies therefore aims to provide the essential application-oriented security and networking infrastructure to enable Service-oriented and Web-oriented architectures (i.e., SOA and Web 2.0) that are central to the next wave of Internet and software innovation.

Managed Methods
www.managedmethods.com

Managed Methods develops and sells practical, versatile, and cost-effective products for monitoring Web services and managing service-oriented architectures. We are headquartered in Boulder, Colorado, in the western United States. Our team has over 10 years of experience in building industry-leading management tools for IT operations which are used by thousands of small, medium, and enterprise-level companies around the world.

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Nexaweb's Enterprise Web 2.0 solutions enable enterprises to rapidly deploy Richer, Thinner, Faster applications over the Web. Specifically, applications built with Nexaweb deliver the high performance and robust functionality of client/server software with the universal reach, no-install deployment and centralized management of browser-based applications. With Nexaweb, building enterprise-strength RIA solutions using AJAX and Java UI applications that access legacy and service-oriented data systems is simple. And because it's done in a unified declarative XML development environment, it doesn't require re-writing code. Only Nexaweb's comprehensive Enterprise Web 2.0 solutions are backed by an established methodology and reference architecture proven by more than 5,000 successful global deployments.

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- Publish our expertise in books, articles, and speaking presentations
- Reflect on the state of the industry and provide leadership to solve problems in technology and business practices
- Provide experts to rapidly solve your scalability and performance problems and to design system architectures and solutions

This unique business approach delivers inexpensive solutions, expert insight and immediate answers that immediately put your organization ahead of the rest.

Solstice Software
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Solstice Software (www.solsticesoftware.com) provides the foremost testing solution for integration and SOA initiatives for large organizations with complex integration requirements-including five of the nation's largest financial institutions. Solstice Integra Suite is the only integration testing platform to deliver true end-to-end testing. With Solstice, customers can automate testing across complex environments by leveraging powerful testing, business process validation, and simulation capabilities against a range of industry-standard protocols and SOA platforms.

Solstice Integra Suite is the only enterprise-level solution that provides a team-based, centralized environment for sharing test assets across the development life cycle. With Solstice Integra Suite, large organizations can dramatically reduce the time to market and cost of new growth-oriented business processes.

TenFold
www.tenfold.com

TenFold™ is a software products and services company with its headquarters in Salt Lake City and major Development centers in San Francisco and Salt Lake City. TenFold licenses EnterpriseTenFold SOA™ to organizations around the world.

EnterpriseTenFold SOA is a comprehensive applications framework for building and running SOA-compliant applications and full-business-functionality services. With minimal coding, it produces high-quality web services that are 100% compatible with J2EE, .NET, and can run on any Enterprise Service Bus and popular RDMSs and operating systems. It uses a model-driven approach that includes powerful applications features in every service and provides a rich, Ajax-enabled web interface for applications users.

EnterpriseTenFold SOA embraces the TenFold Way, a complete, full-lifecycle methodology for building enterprise-scale applications as a collection of robust, reusable services. Basically, EnterpriseTenFold SOA lets you rapidly develop an enterprise application ten times faster and with a tenth the cost of traditional development methodologies because in most cases you just assemble business components and not write code.

Thinstall
www.thinstall.com

Thinstall Virtualization Suite 3.0 is a client-less application virtualization solution that allows applications to be packaged into simple EXE files that run isolated from the host PC, without installation or changes to the local desktop's registry and file system. It significantly reduces the costs associated with software deployment and provides significant reductions in the time associated with regression testing, application deployment and end-user support instances. The unique, client-less architecture allows "Thinstalled" applications to be run from any LAN, WAN, USB, CD-Rom drive, etc., with zero-footprint on the host PC. The applications run exclusively in user mode, ensuring seamless execution on locked-down desktops with no device drives installed, enabling administrations to maintain a secure, clean and stable user desktop and consequently, a heightened level of security.

Trivera Technologies
www.triveratech.com

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www.webagesolutions.com

Web Age Solutions is a leading provider of technology mentoring and education to the Fortune 500. Our "Preferred Vendor" status with these global leaders is a result of our highly progressive approach to knowledge transfer and relentless pursuit of customer satisfaction. While many of our competitors are just now getting their feet wet with SOA, we have been delivering SOA training and mentoring since 2003. Moving well beyond theoretical discussions of SOA, we have a deep library of practical SOA curriculum backed by hands-on experience.

Web Age understands that unique business processes are integrated into every IT strategy. We have the expertise to deliver knowledge transfer programs that are tailored to your organization's approach to SOA. Your business is unique. Your adoption of SOA is unique. Your SOA education program should be too.

webMethods
www.webmethods.com

Software AG and webMethods have come together to create the world's largest independent provider of Business Infrastructure Software. Our 4,000 global customers achieve measurable business results by modernizing and automating their IT systems and rapidly building new systems to meet growing business demands. Our industry-leading product portfolio includes best-in-class solutions for managing data, enabling service oriented architecture, and improving business processes. By combining proven technology with industry expertise and best practices, our customers improve and differentiate their businesses faster.

WSO2
www.wso2.com

WSO2 is an open source middleware company founded by pioneers in Web services and of members of the Apache Software Foundation Web services community. We deliver a new, entirely open source middleware stack that is optimized for Web services and SOA and built on Apache Axis2. WSO2's first products are the WSO2 Web Services Application Server (WSAS) and WSO2 Enterprise Service Bus (ESB), which are built on the WSO2 Web Services Framework. The company maintains operations in the United States, United Kingdom and Sri Lanka.

Speakers

Danny Allan
Techniques for Exploiting – and Protecting – Web Services

TRACK: Interop, Standards & Services

Danny Allan is Director of Security Research with Waltham-based Watchfire, a provider of software and services to help ensure the security and compliance of Websites. In 2000, he joined Watchfire bringing with him several years of business and technology-related experience including penetration testing and internal system remediation for one of Canada's biggest universities. In his role as security analyst, he is closely involved with enterprise global customer deployments, researching and evaluating technologies, and helping define and recommend strategic directions for Watchfire's security solutions. In his more than six years with Watchfire, Allan has held several critical customer-facing positions, including Team Lead, Consulting Services and Sales Engineer. He holds a Bachelor of Commerce with a major in Information Systems from Carleton University.

Michael Baum
Troubleshooting SOA, Web Services and J2EE Source Software Stacks

TRACK: Real-World SOA

During his career, Michael Baum has been building and managing large-scale IT environments at Yahoo, Infoseek, and several companies he's co-founded. His focus now is applying many of the innovations and affordances that grew out of these experiences to the challenges of managing the modern data center. In addition to Splunk, Michael is a co-founder of Collation, acquired by IBM's Tivoli Group; Arthas, acquired by Yahoo; and Reality Online, acquired by Reuters. He was a software engineer at IBM's Silicon Valley Laboratory and a member of the original IBM PC development team. He has a BS in computer science from Drexel University and an MBA from the Wharton Business School at the University of Pennsylvania. Michael is also a regular speaker at industry conferences including Interop and LinuxWorld and writes about IT troubleshooting for InfoWorld.

Kadeer Beg
WebSphere Process Server Drives End-to-End SOA: Integration for a Real-World Application

TRACK: Hot Topics

With over 15 years of experience in delivering and architecting large-scale systems across multiple platforms, Kadeer Beg has provided consulting to Fortune 500 clients and worked in senior management for Societe Generale, New Era of Networks, Sapient, Bell Canada, Cendant, and IBM. Kadeer currently heads up the SOA Technology Practice at Prolifics.

Jason Bloomberg
Enterprise Mashups and SOBAs: Which Is the Tail and Which Is the Dog?

TRACK: Web 2.0/AJAX and SOA

Jason Bloomberg is senior analyst and principal at service orientation and enterprise Web 2.0 advisory and analysis firm ZapThink LLC. He is a leading thought leader in the areas of enterprise architecture and service-oriented architecture, and helps organizations around the world better leverage their IT resources to meet changing business needs. He is a frequent speaker, prolific writer, and pundit. His latest book, Service Orient or Be Doomed! How Service Orientation Will Change Your Business (John Wiley & Sons, 2006, coauthored with Ron Schmelzer), is recognized as the leading business book on service orientation. Jason has a diverse background in eBusiness technology management and industry analysis, including serving as a senior analyst in IDC's eBusiness Advisory group, as well as holding eBusiness management positions at USWeb/CKS (later marchFIRST) and WaveBend Solutions (now Hitachi Consulting). He also co-authored the books XML and Web Services Unleashed (SAMS Publishing, 2002), and Web Page Scripting Techniques (Hayden Books, 1996).

Toufic Boubez
Policy-Driven SOA

TRACK: Hot Topics

Toufic Boubez is the co-founder and CTO of Layer 7 Technologies. Prior to co-founding Layer 7 Technologies, he was the chief Web services architect for IBM's Software Group and drove their early XML and Web services strategies. Toufic co-authored the original UDDI API specification. He's the co-editor of the W3C WS-Policy specification, and is a co-author of the WS-Trust, WS-SecureConversation, and WS-Federation specifications. Toufic is a sought-after presenter and has chaired XML and Web services conferences. In 2002, InfoWorld named Toufic to its "Ones to Watch" list. An author of many publications, one of his most recent books is "Building Web Services with Java: Making Sense of XML, SOAP, WSDL, and UDDI."

Bob Buffone
Solving the Last Mile of SOA with Enterprise Web 2.0

TRACK: Web 2.0/AJAX and SOA

Bob Buffone, Chief Architect, is responsible for platform and tool technology at Nexaweb Technologies, Inc., a provider of the leading standards-based platform for building and deploying Enterprise Web 2.0 (EW2.0) applications. Bob is also a committer on the Apache XAP Project, which provides an extensible framework for declaratively creating Ajax applications. Before Nexaweb Bob was with Trakus, a technology company focused on tracking sports in real time. A leading expert in User Interface design, he is a regular speaker at industry events and has published multiple articles on tool and application development.

Arjé Cahn
Open Source Content Management in the Enterprise - Ready to Integrate?

TRACK: Enterprise Open Source

Arjé Cahn is CTO of Open Source Content Management developer Hippo (Amsterdam, The Netherlands). He runs the Hippo open source team at www.hippocms.org. and has earned his merits in the open source world with an Apache committership. Arjé is a regular speaker on the subjects of open source, XML, and Cocoon and has been involved in the organizing committees of several Apache conferences. He has written for both technical and business publications on open source. He blogs at blogs.hippo.nl/arje/.

Dave Chappell
ESB Delivering SOAs

TRACK: Interop, Standards & Services

Dave Chappell is vice president and chief technologist for SOA of Oracle. He has over 20 years of experience in the software industry covering a broad range of roles including architecture, code-slinging, sales, support and marketing. He is well known worldwide for his writings and public lectures on the subjects of service-oriented architecture (SOA), the enterprise service bus (ESB), message-oriented middleware (MOM), enterprise integration, and is a co-author of many advanced Web services standards and a regular speaker at SOA World Conference & Expo since 1999.

Neelan Choksi
Money Can't Buy an Open Source Community

TRACK: Enterprise Open Source

Neelan Choksi is VP, Americas, of Interface21. He aims to capitalize on the Spring Framework's tremendous popularity by broadening the company's product portfolio. Neelan also founded SolarMetric, which was acquired by BEA Systems. At BEA, Choksi led the effort to open source the technically heralded Kodo product as the OpenJPA project. He blogs at http://blog.interface21.com/main/author/neelanc/.

Jonathan Clark
Virtualization Power Panel & Application Virtualization: Instant Migration to Vista, Fast Delivery, Secure Access, Side-by-Side Deployments

TRACK: General Session & Virtualization

Jonathan Clark, Founder, CTO & President of Thinstall, co-founded the video game development company Crack dot Com in 1994, which produced the original PC and Mac titles Abuse and Golgotha and ported Doom and Quake to Unix platforms. He founded Thinstall in 1999 originally focusing on virtualization and copy protection technology solutions for software publishers. The first version of Thinstall for application virtualization was released in 2001 after several years of R&D. Mr. Clark continues the development of Thinstall technology for the enterprise and participates in the company's business direction.

Frank Cohen
FastSOA - The Driving Forces Behind SOA and Why Developers Care

TRACK: SOA Technology Track

Frank Cohen is the leading authority for testing and optimizing software developed with service-oriented architecture (SOA) and Web service designs. He is CEO and Founder of PushToTest and inventor of TestMaker, the open source SOA test automation tool that helps software developers, QA technicians, and IT managers understand and optimize the scalability, performance, and reliability of their systems.

Dan Corsberg
Tenacious Defense: Security-Oriented Architectures

TRACK: Hot Topics

Dan Corsberg has extensive experience in XML and Java development and Web-based architectures. He holds three software patents, working on projects such as collaborative authoring, Web services, and enterprise integration. In addition, he works as a curriculum designer, course author, mentor, and instructor of software curricula for industry professionals.

John Crupi
The 'A' in SOA Should Be AJAX

TRACK: Web 2.0/AJAX and SOA

John Crupi is the CTO of JackBe Corporation. As CTO he is entrusted with understanding market forces and business drivers to drive JackBe's technical vision and strategy. John has 20 years of experience in OO and enterprise distributed computing. Previously, John spent eight years with Sun Microsystems, serving as a Distinguished Engineer and CTO for Sun's Enterprise Web Services Practice. He is co-author of the highly popular Core J2EE Patterns book, has written many articles for various magazines, is a frequent blogger, and is a well-known speaker around the globe.

Cornelia Davis
The Real Deal: Comparing & Contrasting Interoperability Standards and Trends

TRACK: Interop, Standards & Services

Cornelia Davis is a consulting technologist in the EMC CTO Office focusing on information modeling, content management, and collaboration. Particular areas of interest include the technological underpinnings of the semantic Web as well as the utilization of Internet-based technologies and architectures within the corporate enterprise. She advocates the decoupling of not only services from historically monolithic enterprise applications but also the decoupling of the data. To this end she is actively involved in efforts to produce standardized interfaces for Enterprise Content Management, information modeling and operational semantics included. She has 20 years of experience in software and holds a BS and an MS in computer science from California State University, Northridge, and blogs at www.corneliadavis.com.

Speakers

Jeff Dierckman
Event-Driven SOA with Complex Event Processing

TRACK: Hot Topics

Jeff Dierckman is an integration architect at Sallie Mae where he developed a custom service infrastructure that currently supports millions of requests per day. His current areas of interest are event-driven architectures, REST services, and semantics.

Kevin Epstein
Adaptive Infrastructure - Dead Bare Metal to Live Connected Servers in Five Minutes or Less

TRACK: Virtualization

Kevin Epstein is the VP Products for Scalent Systems with a degree in high-energy nuclear physics and a Stanford MBA, several technology patents in his name, founding experience at three successful ventures, and more than 15 subsequent years of experience in guerrilla marketing tactics at such software industry high-flyers as Netscape, RealNetworks, Inktomi, and VMware.

Yakov Fain
SOA, RIA & the Human Factor

TRACK: SOA, RIA & the Human Factor

Yakov Fain is a managing principal of Farata Systems, a consulting, training, and product company. He is the Enterprise Editor of Java Developer's Journal and has authored several Java books and dozens of technical articles. This year he co-authored the book Rich Internet Applications with Adobe Flex and Java: Secrets of the Masters. Sun Microsystems has nominated and awarded Fain with the title Java Champion. He leads the Princeton Java Users Group.

Chris Farrell
Getting the Most from Your SOA: Using a Modeling Approach for Application Performance Management

TRACK: Hot Topics

With 20 years of technology experience, Chris Farrell is responsible for bringing ClearApp's APM software to market. Before ClearApp, he worked at Wily Technology, where he headed up several marketing organizations, including product management. Prior to Wily, Chris was a senior product manager and development engineer at IBM.

Frédéric Faugère
Presentation & Demo by webMethods

TRACK: General Session

Frederic Faugere is the SOA lead at National Bank of Canada, an integrated group that provides comprehensive financial services to consumers, small and medium-sized enterprises and large corporations in its core market, while offering specialized services to its customers elsewhere in the world. With more than 6 years at National Bank of Canada, Frederic is part of the corporate architecture team and in charge of leading the initiative to build an Integration Competency Center at the Bank. He has an MS in computer science.

Patrick Felstead
Achieving Interoperability with Windows CardSpace in the Open Enterprise

TRACK: Hot Topics

Patrick Felstead is the maintainer of a leading edge identity technology open source project called Bandit (http://www.bandit-project.org). His responsibilities include building and approving architectures of the components we are producing: Common Identity (Higgins), Authentication, Authorization (RBAC and XACML), Audity and Compliance record emmitting, and Persistence. He is building a community around this project and defining goals and assigning tasks to those participating and will also provide much of the content and organization to the wiki pages used to collaborate. Patrick also communicates with many other products inside of Novell and coordinates their uses of Bandit components. Patrick is owner and CTO of Agemni, an ASP that provides a CRM application specific to the satellite reseller. The company was started in 2002 and is one of the leaders with many of the largest Echostar and DirecTV resellers.

Pierre Fricke
Open Source Penetration and Use in SOA Deployments

TRACK: Enterprise Open Source

Pierre Fricke is director of product line management for Red Hat's JBoss Portal and SOA products. Starting with JBoss Portal and jBPM in 2005, he led the product strategy and management expansion into the integration and SOA market with JBoss Rules, Messaging and Enterprise Service Bus. Today, these products are the unit volume market leader or emerging strong challengers to long-time incumbents. He started working on UNIX at IBM in 1983 as one of the first AIX developers, building experience in data management, operating systems, communication programs, development processes, and customer support. After holding several software development management positions and completing his MBA at the University of Texas in Austin, he became one of the leading strategists and marketing leaders in IBM focusing on interoperability, integration, WebSphere, Windows NT, UNIX, as well as Linux and open source. He led the creation of IBM's "Compete, Leverage, and Interoperate" Windows NT strategy after OS/2 was discontinued and was one of the eight original leaders on the team that lead IBM into Linux and open source in 1998 and 1999. In 2000, Fricke joined D. H. Brown Associates, a research analyst firm, as VP of application and integration infrastructure.

Kyle Gabhart
Service-Oriented Patterns and Anti-patterns

TRACK: Real-World SOA

Kyle Gabhart is a subject matter expert specializing in service-oriented technologies and currently serves as the SOA Lead for Web Age Solutions, a premier provider of technology education and mentoring. He is a popular public speaker recognized for his enthusiasm and dynamic analysis of emerging technologies. Since 2001 Kyle has contributed extensively to the SOA/Web Services body of knowledge as an author, speaker, consultant, and open source contributor. He maintains a SOA blog at www.soamatters.com and can be reached by e-mail at kgabhart@webagesolutions.com

Alain Gendre
Connecting SOA with BRMS (Business Rule Management System)

TRACK: Interop, Standards & Services

Alain Gendre leads the SOA solution division and BPM Program for ILOG's Strategic Business Development Division. As the head of the program, he brings several years of experience in the ILOG Business Rule Management System, Optimization and Visualization products. He received an engineering degree in computer science (Artificial Intelligence) at the Engineering School of Nimes (France) in 1994.

David Greschler
Keynote: Virtualization Beyond the Datacenter

TRACK: General Session

David Greschler is the director of virtualization strategy, System Center division at Microsoft Corp. He is a director of System Center marketing, and is focused on virtualization management tools for the desktop and datacenter. David came to Microsoft with the July 2006 acquisition of Softricity. Prior to joining Microsoft, he was co-founder of Softricity, developers of SoftGrid and the originator and leading vendor of the application virtualization industry. With more than 20 years of pioneering experience in the computer field, David has held various positions at the MIT Media Lab and The Computer Museum, and holds numerous virtualization patents.

Mark Hansen
SOA Using Java Web Services and AJAX

TRACK: Hot Topics

Mark Hansen is the author of "SOA Using Java Web Service" (Prentice Hall), a programmers guide to Java Web Services. His company, Javector Software, provides Web Services. Mark holds a PhD from the MIT Laboratory for Computer Science, and an MBA from the MIT Sloan School of Management.

Søren Hartvig
Open Source SOA Realized

TRACK: Enterprise Open Source

Søren Hartvig is chief architect and Open Source Software Champion at Capgemini Consulting. Since 1996 Søren has been focusing on Java technologies, and has been a participant in Capgemini, delivering projects based on this. Throughout the years of delivering full-scale enterprise systems within the vast amount of sectors, including telecommunication, health care, public, government, transport and financial, Søren has focused on how to adapt the open source software communities into the enterprise software market. As the attention on standards and SOA-driven architectures has grown in the past couple of years, Søren has, within the Capgemini group, delivered more full-scale SOA solutions based largely on open source software components.

Doug Hass
Quality of Service and Firewalls with Open Source Tools

TRACK: Enterprise Open Source

Doug Hass is director of business development of ImageStream, a leading router and WAN product manufacturer. Prior to joining ImageStream, he was a partner in Midwest-based Internet provider Skye/net. An Army veteran, certified personal trainer, and outdoorsman, Doug rode professional rodeo for five years, and founded Roughstock.com, an award-winning country music site.

Rob High
Presentation & Demo by IBM

TRACK: General Session

Rob High is the Chief Architect for the SOA Foundation, an IBM Distinguished Engineer, and member of the IBM Academy of Technology. He has responsibility for both ensuring an open industry architectural definition of the principles of Business and IT alignment enabled by SOA, as well as ensuring IBM's software and services portfolio is architecturally grounded to enable for efficient SOA based solutions. This responsibility extends across the IBM software portfolio, including WebSphere, Rational, Tivoli, Lotus and Information Management products relevant to enabling SOA. Rob has 29 years of programming experience and has worked with distributed, object-oriented, component-based transaction monitors for the last fourteen years, including SOMObject Server, Component Broker and most recently the WebSphere Application Server. Prior to his current responsibility, Rob was the Chief Architect for the WebSphere foundation with architectural responsibility for the WebSphere Application Server and the related products integrated on that core runtime.

Speakers

Andrew Hillier
The Next Big Challenge: Managing the Virtualized Data Center

TRACK: Virtualization

Andrew Hillier, CTO and co-founder of CiRBA, has over 15 years of experience in the creation and implementation of mission-critical software for the world's largest financial institutions and utilities. A co-founder of CiRBA, he leads product strategy and defines the overall technology roadmap for the company.

Hideki Hiura
The Business Value of Bringing XBRL into the SOA Fold

TRACK: Interop, Standards & Services

Hideki Hiura is chief scientist and CTO of JustSystems, Inc. He is a founder and chairperson of OpenI18N.org/Free Standards Group, an independent, nonprofit organization dedicated to accelerating the use of free and open source software by developing and promoting standards. He is also a founding member of W3C I18N WG. Prior to JustSystems, as an architect at Sun, he was involved with a variety of standards and standard organizations including ISO, W3C, OMG, The Open Group, OSF, Unix International, X Consortium, and Unicode.

Fred Holahan
SOA Power Panel & SOA Orchestration: Using BPEL to Power Your Composite Apps

TRACK: General Session & Hot Topics

A respected entrepreneur and speaker, Fred Holahan is one of the software industry's foremost experts on business and systems integration. He is chairman of Active Endpoints Inc., the leader in BPEL-based SOA orchestration.

Wayne Hom
Web 2.0: The Rise and Fall of the User Experience

TRACK: Web 2.0/AJAX and SOA

Wayne Hom is EVP & CTO of Augmentum. He has 20 years of experience inventing, developing, and delivering commercial software technologies. He comes to Augmentum from Vitria, where he was VP of solutions engineering. Previous positions include VP of user experience at Zaplet; VP and chief architect at Walker Interactive; Windows architect, Cadence Design Systems; and chief architect, Symantec. Wayne has driven a diverse set of software products including shrink wrap PC project management software, workstation-based CAD tools, mainframe-based ERP systems, client/server-based financial reporting systems, Web-based collaboration systems, and vertical industry focused reporting and business process management systems. He has outsourced software development ranging from application components for the financial and health care verticals, to ground up development of reporting tools, to complete product development and QA in India and in China.

Rami Jaamour
How to Make Your SOA Work: 10 Steps for Establishing a Successful, Automated Regression Testing Strategy

TRACK: SOA Technology Track

Rami Jaamour is the product manager for SOA Solutions at Parasoft. He has contributed to the WS-I Testing Tools Work Group and the Apache Software Foundation, where he contributed to the WSS4J project, an open source WS-Security implementation for Java. Rami has published articles related to Web services security, and spoke at several events related to SOA and Web services. His experience with SOA and Web services includes the development of effective Web services automated testing methodologies and working with many of Parasoft's customers to ensure secure, reliable and compliant Web services.

Sajindra Jayasena
Improving Customer Experience Through SOA and Web 2.0: A B2B Telecom Use Case

TRACK: Web 2.0/AJAX and SOA

Sajindra Jayasena is a senior software architect at Virtusa Corporation, a global provider of IT consulting, technology implementation and outsourcing services focused on transforming IT through software platforming. He has led numerous IT architecture, strategy and implementation projects for over five years, and in the recent past has focused on SOA-based enterprise platforms. Sajindra counts over 11 years' expertise in J2EE/J2SE development and design, including J2SE/J2EE Open Source enterprise platforms. Sajindra is currently the lead technical architect of the Openreach Portal Platform for British Telecom's new Openreach organization. He has also played senior consultant and architect roles on a number of leading banking and finance projects at Virtusa.

Simon Laws
Building SOA with Apache Tuscany

TRACK: Enterprise Open Source

Simon Laws is a member of the IBM Open Source SOA project team working with the open source Apache and PHP communities to build Java, C++, and PHP implementations of the Service Component Architecture (SCA) and Service Data Object (SDO) specifications. Prior to this role he was working in the distributed computing space building service-oriented solutions for customers with a particular interest in grid computing and virtualization.

Doug Levin
EOS Power Panel

TRACK: General Session

Doug Levin founded Black Duck Software (www.blackducksoftware.com) in 2002 and has been its Chief Executive Officer and President since its inception. From 1987 to 1995, Doug held various senior management positions with Microsoft Corporation including heading up worldwide licensing for corporate purchases of non-OEM Microsoft software products. Doug is an adjunct lecturer of Entrepreneurship and Management (on leave-of-absence) at the Kenan-Flagler Business School at his alma mater, the University of North Carolina at Chapel Hill. He also holds a certificate in international economics from the College d'Europe in Bruges, Belgium.

Rob Levy
SOA & Web 2.0 Through the Lens of Society: the Consumerization of the Enterprise

TRACK: General Session

Rob Levy is executive vice president and CTO of BEA Systems. He leads the company's efforts to align BEA's technology vision with its business strategy. He is responsible for developing and implementing technology initiatives within the company and fostering BEA's commitment to software innovation and open standards. Previously, Rob was executive vice president of New Products Strategy, responsible for all aspects of the BEA AquaLogic product line, including research and development, product management, support, quality assurance and strategic planning. He has over 25 years of experience in leading all aspects of the computer software and services business and a proven track record of running large development organizations.

David S. Linthicum
'Web 2.0'? – It's the Universal SOA

TRACK: Web 2.0/AJAX and SOA

David S. Linthicum is an internationally known application integration and service-oriented architecture expert. In his career he has formed many of the ideas for modern distributed computing including EAI (Enterprise Application Integration) and B2B application integration, and service-oriented architecture (SOA) approaches and technology in wide use today. He's held key technology management roles with a number of organizations including CTO of Mercator, SAGA Software, Mobil Oil, EDS, AT&T, and Ernst and Young. In addition David was an associate professor of computer science for eight years, and continues to lecture at major technical colleges and universities. He has authored over 500 articles for major computing publications, and has monthly columns in several popular industry magazines. His latest book, Next Generation Application Integration, was just released and is already a bestseller.

Paul Lipton
The New SOA Synergy: How Runtime Governance, Triage, and Security Must Work Together

TRACK: Real-World SOA

Paul Lipton is senior architect specializing in SOA and Web services in the Wily Technology Division of CA. He has served in CA's Office of the CTO as a strategist, and has been an architect and developer of enterprise systems for over 20 years. Paul has also participated in many standards organizations, is a founding member of the CA Council for Technical Excellence, a Microsoft MVP, and a Sun Java Champion. He is a highly sought-after author and speaker, and has shared his knowledge around the world covering such topics as enterprise architecture, SOA, Web services, management/security, governance, Java, .NET, and EAI.

Bob Lozano
Service Virtualization and the Large-Scale Service-Oriented Application

TRACK: Virtualization

Bob Lozano is a technology industry veteran, serial entrepreneur, and co-founder and chief strategist of Appistry, a software company pioneering the convergence of grid computing, virtualization, and service-oriented architecture. Bob founded and led successful companies PaylinX and Tapestry Computing. He holds a BS in electrical engineering from the University of Missouri and an MS in electrical engineering from Stanford University.

Sastry Malladi
SOA Deployment Challenges in the Real World

TRACK: Real-World SOA

Sastry Malladi is a technology evangelist with over 18 years of experience in architecting and building scalable distributed computing systems in the areas of application servers, Java/J2EE/Web services, SOA and grid computing. He is currently a principal architect at eBay, driving the SOA architecture for the eBay e-commerce platform. Prior to joining eBay, Sastry was co-founder and CTO of OpenGridSolutions, a founding member and Architect at SpikeSource, and architect at Oracle. He holds a master's degree from I.I.T, Kharagpur, India, and has contributed to and represented in many standards at OMG, JCP, GGF and OASIS.

Speakers

Javier Mariscal

The Proper Design of Interoperability Solutions

TRACK: Interop, Standards & Services

Javier Mariscal is the president and founder of TwoConnect, Inc, a highly renowned consulting and systems integration company based in Miami, Florida, with subsidiary offices in New York City and San Francisco. After nearly 15 years, Javier is still mostly responsible for guaranteeing that TwoConnect's innovative integration solutions deliver real and immediate results to its clients. As an author and frequent speaker on SOA and related technologies, he constantly reaffirms the need for "practical SOA," which focuses not on pushing a brand or a platform but on delivering immediate business rewards. In 2006, TwoConnect announced a new line of products and services under its AdapterWorx brand, which has been hugely successful in accelerating its SOA solutions delivered. Following the success of AdapterWorx and a banner year in 2006 in general, Javier was nominated for Entrepreneur of the Year by Hispanic Business Magazine.

Frank Martinez

Social Networking for Service-Oriented Archictecture

TRACK: Real-World SOA

Frank Martinez, executive vice president of product strategy, is a recognized expert in the area of distributed, enterprise application and infrastructure platforms. He is focused on driving development of scalable service-oriented infrastructure software that integrates business processes and information enterprise-wide. Frank's reputation as a technological visionary is demonstrated by his record of bringing innovative and commercially successful software solutions to market. He has had operating roles as a senior executive of several VC-backed firms, and was instrumental in building Intershop Communications into a multi-billion dollar public company in less than three years. He was recently named an InfoWorld Innovator by InfoWorld magazine and has also been named one of 25 leading IT innovators by CRN.

Miko Matsumura

Pragmatic SOA: Governance by Consent

TRACK: Real-World SOA

Miko Matsumura is vice president, SOA products at webMethods and chair of the OASIS SOA Adoption Blueprints Technical Committee. He is well recognized for his work at The Middleware Company, Systinet, and as Chief Java Evangelist for Sun Microsystems. He has an MBA from San Francisco State University and a masters in neuroscience from Yale University.

Dave Mavashev
SOA Power Panel

TRACK: General Sessions

David Mavashev is a leading expert on IT infrastructure, middleware and messaging technologies with over 25 of years experience architecting systems and solutions. His areas of expertise encompass implementing service oriented architectures and the underlying infrastructure monitoring that is fundamental for SOA governance, as well as tools and technologies for monitoring and managing integrated application processes and performance across the enterprise, and helping companies achieve business agility through effectively aligning IT with business processes in the real-time enterprise. A successful entrepreneur, David founded Nastel in 1994 and also served as the company's CTO for many years. Prior to that, he was the technical manager of the messaging group at NYNEX, where he architected and managed the implementation of the first commercial transactional messaging product, which now forms the basis for IBM WebSphere MQ (formerly MQ-Series). A pioneer in the early evolution of messaging technologies, David logged many years as an IT consultant working with some of the world's foremost banks and financial institutions.

Joe McKendrick

JBOWS* or SOA? – A Reality Check (*Just a Bunch of Web Services)

TRACK: Interop, Standards & Services

Joe McKendrick is a nationally published known author and consultant with deep knowledge and insights regarding trends and developments in the technology industry. He is a contributing editor to a number of national and international publications and Websites including Database Trends & Applications, Webservices.Org, ENT Online, and Enterprise Systems. He also serves as analyst for Evans Data Corp., for which he coauthors Evans' Web services survey reports, and is lead analyst for Evans' enterprise development management issues and database development surveys.

John Michelsen

Be Where the Green Grass Grows: Why Continuous Testing Is Important to Meet the Growing Needs of Life-Cycle Governance

TRACK: Hot Topics

John Michelsen is the founder & chief architect of iTKO's LISA automated testing product and a leading industry advocate for software quality, learned through leading countless large-scale enterprise development projects. Before forming iTKO, John was CTO at Trilogy Inc., and VP of development at AGENCY.COM.

Laurence Moroney

Jump-start SOA in a Mixed Portal Environment

TRACK: Real-World SOA

Laurence Moroney is a senior architect and the director of technology evangelism for Mainsoft Corporation, where he is responsible for counseling customers about their interoperability and porting challenges. Previously, he worked in several fields designing architecture for financial services systems, airports, casinos, and professional sports.

Debbie Moynihan

Open and Closed Source SOA

TRACK: Enterprise Open Source

As director of open source programs for IONA, Debbie Moynihan is responsible for driving the strategic product marketing and product management activities for IONA's open source line of business. She brings more than 15 years of software industry experience and expertise to her role, including several years in IBM Software Group with product marketing and product management responsibility for the WebSphere Commerce and WebSphere Business Integration & Business Process Management product families.

Diane Mueller

The Business Value of Bringing XBRL into the SOA Fold

TRACK: Interop, Standards & Services

Diane Mueller is VP, XBRL Development, focused on financial services and XBRL at JustSystems Canada. She has been designing and implementing products and applications embedded into mission-critical financial and accounting systems at F500 corporations for over 20 years. Diane has been actively involved in development efforts of the XBRL standard for the past seven years. She is currently a Member of the XBRL International Steering Committee. She was co-chair of the 14th XBRL International Conference, a past at-large member of theXBRL-US steering committee, the past chair of the XBRL/GL working group and a contributor to the Canadian GAAP XBRL taxonomy.

Jeffrey M. Nick

Keynote: Service-Oriented Infrastructure in a Web 2.0, Virtualized World

TRACK: General Session

Jeff Nick, SVP and CTO of EMC, joined the company in September 2004 from IBM, where he held the distinguished title of IBM Fellow, the highest technical honor that IBM bestows on its IT innovators. During his 24-year career with IBM, he filed more than 80 inventions and holds more than 50 U.S. patents in computer systems technology. Most recently, Jeff was vice president, architecture and design, eBusiness On Demand, responsible for the design and architecture of IBM's On Demand initiative. He also led IBM's grid computing strategy, responsible for the definition and evolution of IBM's Open Grid Services Architecture. Jeff began his IBM career as a software engineer focusing on the System 390 MVS operating system, and he eventually became the lead architect for the S/390 z-series platform and eServer initiative. He graduated Magna Cum Laude from Marist College with a BS in finance.

Dale Olds

Achieving Interoperability with Windows CardSpace in the Open Enterprise

TRACK: Hot Topics

Dale Olds is a Distinguished Engineer and serves as an architect for identity-enabled open-source technologies. Dale was the lead designer and implementer of Novell Directory Services/eDirectory from 1990 to 2000. Dale has a BS in Computer Science from the University of Utah. He writes code for fun.

Tim Pacileo
Misconceptions of Virtualization

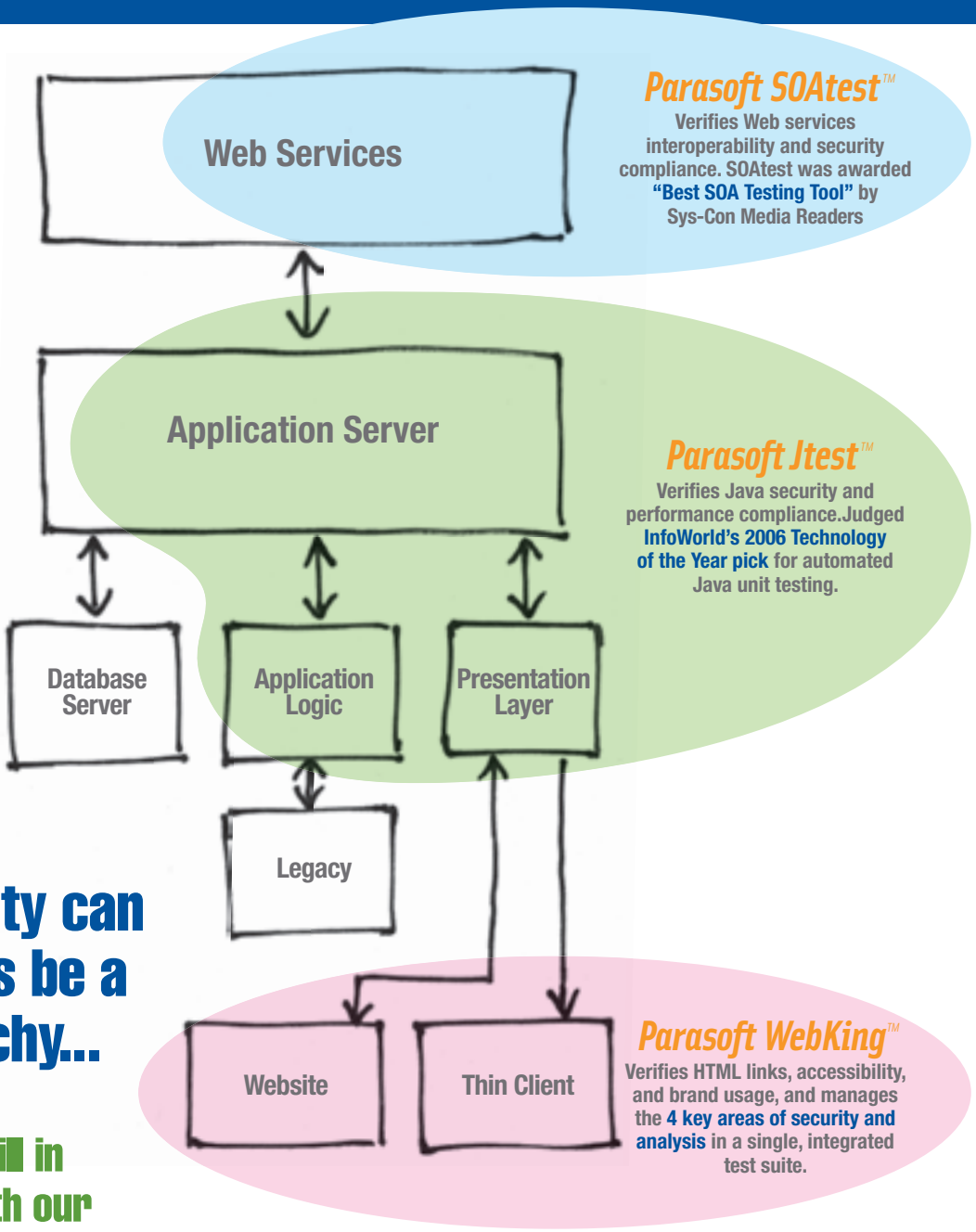
TRACK: Virtualization

Tim Pacileo is an Executive Consultant specializing in IT strategy; architecture design; sourcing; enterprise application selection, implementation and oversight; business continuity planning; software and hardware evaluation and selection; and infrastructure design, focusing on data center and server consolidation, storage area networks (SANs). Prior to joining Compass, he was with Gartner Consulting.

Michael Peachy
How to Get Richer Faster with an AJAX RIA and SOA Strategy

TRACK: Web 2.0/AJAX and SOA

Michael Peachey is product manager and director of engineering for TIBCO Software's acclaimed AJAX and Rich Internet Application (RIA) toolkit: TIBCO General Interface. A recognized leader in AJAX innovation, Michael co-founded General Interface in 2000 with a vision for applications that performed like desktop GUIs, but ran in the browser. Since 2000 he has overseen the development of AJAX frameworks and solutions that have powered astoundingly rich Web applications in demanding Fortune 500 and U.S. Government deployments. Michael has furthered this vision with TIBCO since the 2004 acquisition of General Interface Corp. He has worked with leading businesses such as American Express, Hearst Publishing, Intuit, and many others to deliver business solutions optimized around Internet technologies since 1992.



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Speakers

Alessandro Perilli
Virtualization: State of the Union & Virtualization Power Panel

TRACK: Virtualization & General Session

Alessandro Perilli has been an evangelist in the virtualization industry since 2003, through his popular blog virtualization.info. As an industry analyst his work is mostly focused on observing and reporting on new and ongoing market trends, and maintaining a tight relationship with consolidated vendors and emerging startups. Alessandro has a parallel focus in the computer security industry, in which he has been active for more than 10 years, achieving certifications such as the CISSP, and collecting awards such as the Microsoft Most Valuable Professional (MVP).

Chris Poelker
VM Ware and Storage Virtualization – A Comprehensive Approach to Manage, Allocate, and Protect Virtual (VMware) Data

TRACK: Virtualization

Christopher Poelker is VP Enterprise Solutions, FalconStor. Prior to this, he was a storage architect at HDS. Before HDS, Chris was a lead storage architect at Compaq, where he built the sales/service engagement model for Compaq StorageWorks, and trained VARs and Compaq ES/PS on StorageWorks. His certifications include: MCSE, MCT, MASE, A+ certified.

Matt Quinn
How to Simplify Heterogeneous SOA: Service Virtualization

TRACK: Virtualization

Matt Quinn is senior vice president, product strategy for TIBCO Software, Inc. He has been with the company for over seven years, working a variety of key positions. As an expert in agents and highly distributed complex systems, Matt is often called upon to help customers solve some of their most challenging integration problems. He has written a PhD thesis on "Distributed Workflow Systems" and is currently completing a book on enterprise architectures.

Sean Rhody (Moderator)
SOA Power Panel & Enteprise Integration with SOA: Achieving the Promise of EAI Without the Cost

TRACK: General Session & Interop, Standards & Services

Sean Rhody is the editor-in-chief of SOAWorld Magazine. He is a respected industry expert and a consultant with a leading consulting services company.

Marc Rix
Bottom Line SOA

TRACK: Real-World SOA

Marc Rix is a lead SOA solutions architect at SAIC, focused on accelerating key business activities through SOA and BPM. He has been building enterprise-scale integration solutions for the past 10 years.

Peter Roden
OASIS, SOA, Open Standards, and Open Source

TRACK: Enterprise Open Source

Peter Roden, director of technology development, is responsible for leading OASIS business development and technology services. He served as the CTO for numerous venture-funded companies where he was responsible for the development and support of Web-based commercial software products. He was the founder and CEO of SupplyWorks, Inc., a leading provider of business-to-business electronic commerce services and solutions that leverage the Internet to empower manufacturing procurement. Peter received an associate's degree in film and Communications from McGill University in Montreal, a BS in computer science from Antioch University, San Francisco, and pursued graduate studies in the management of technology at Harvard and MIT. Peter is based in Boston and speaks English, Czech, and French

Jesus Rodriguez
The Proper Design of Interoperability Solutions

TRACK: Interop, Standards & Services

Jesus Rodriguez is the chief software architect at TwoConnect, Inc. (www.twoconnect.com), a Microsoft Gold Partner based in Miami, Florida. He is also a Microsoft BizTalk Server MVP and one of a few architects worldwide to be a member of the .NET 3.0 Digerati team. As a member, Jesus has been selected to participate in a variety of Software Design Reviews with Microsoft's Product Teams. Jesus is the Lead Architect for several BizTalk Server adapters including Web Services Enhancements 3.0, SalesForce.com, SonicMQ and the award winning Service Broker Enhancements. He is an active contributor to the .NET and J2EE communities, focusing on the interoperability aspects between those two platforms. His contributions include several articles for various publications including MSDN, Architecture Journal and SOA World Magazine. Jesus is frequently seen leading sessions at TechEd, MVO Summit and the Microsoft Business Process and SOA Conference, as well as conducting Web Casts on varying Microsoft technologies. He is a prolific blogger on all subjects related to integration and has a true passion for technology.

David Roth
Application Virtualization

TRACK: Hot Topics

David Roth is CEO of Trigence. He brings deep industry and leadership experience to Trigence. Most recently, he was vice president of sales and business development at Consera Software, which was acquired by Hewlett-Packard in February 2004. Crossing over to the HP team, David was responsible for integrating Consera software into HP OpenView Automation Manager. He holds a BA in business communications from the University of Southern California.

Ajit Sagar
SOA – Does the Shoe Fit?

TRACK: Real-World SOA

Ajit Sagar is a principal architect with Infosys Technologies, Ltd., a global consulting and IT services company. He has more than 15 years of experience in the IT industry. During this tenure, he's been a programmer, lead architect, director of engineering, and product manager for companies from 15 to 25,000 people in size. Ajit has served as J2EE Editor of Java Developer's Journal, was the founding editor of XML-Journal, and has been a frequent speaker at SYS-CON's Web Services Edge series of conferences, at JavaOne, and other international conferences as far away as China. He has published more than 125 articles.

Sekhar Sarukkai
Deploying Entitlements in an SOA & Securing Your SOA: Entitlement Management in a Service-Oriented Architecture

TRACK: Real-World SOA and Interop, Standards & Services

Sekhar Sarukkai is the co-founder and CTO of Securent, a leader in enterprise entitlement management. Prior to this, he co-founded Confluence Software, a Web services security company, and was also a chief architect for HP's e-Speak initiative. He holds MS and PhD degrees in computer science from Indiana University.

Nitin M. Sawant
SOA and Rich Internet Applications (RIA)

TRACK: Web 2.0/AJAX and SOA

Nitin Madhukar Sawant is an IT architect and consultant with Accenture India. He holds an M. Tech in Software Engineering from NUS Singapore, and has 13 years of experience in the IT industry as an Architect. He holds a Certified Information Systems Security Professional certification (CISSP) from the ISC, is a Certified Ethical Hacker (CEH), and also holds a diploma in CyberLaw.

Bill Soward
The Convergence of SaaS and Open Source: Enterprise Software's Emerging Business Model

TRACK: Hot Topics

Bill Soward is CEO of Adaptive Planning. Previously, he was an EIR at Accel Partners. Prior to Accel, he was GM of FRS, S1's most successful business unit. He was also interim CEO of S1 Europe and S1's Edify business unit, and held various executive roles at Edify and Rolm.

Dr. Hal Stern
Introductory Keynote by Sun's Distinguished Engineer & VP, Global Systems Engineering

TRACK: General Session

Dr Hal Stern is Distinguished Engineer & VP, Global Systems Engineering, Sun Microsystems. In his more than 13 years with Sun, Hal has been CTO, Sun Services; chief architect of Sun Professional Services; CTO for the Sun ONE (iPlanet) infrastructure products division; and the chief technologist of Sun's Northeast U.S. Sales Area. He has done architecture, performance, and reliability work for Major League Baseball, mlb.com, several financial information and transaction clearing networks, and defined next-generation interactive services as part of Sun's technology partnership with the National Hockey League. He is listed as inventor or co-inventor on three networking technology patents and has co-authored technical books on networking and high availability techniques. Before joining Sun, Hal developed molecular modeling software for a Boston area start-up company and was on the research staff at Princeton University.

Michael Stiefel
Speaking the Same SOA Language: OASIS Reference Model for SOA

TRACK: Interop, Standards & Services

Michael Stiefel is principal of Reliable Software. A consultant on software architecture and development, and the alignment of information technology with business goals, his current work involves training in distributed applications development, software best practices, in .NET, C#, Web services, C++, and SQL Server. He also advises on IT strategy and planning, including budgeting, hiring, and growth management, and designs and implements service-based applications including Web services. Michael is currently a member of the OASIS Technical Committee developing a core SOA Reference Model and related reference architectures. In July 2006 he was named a Microsoft Visual Developer Solutions Architect MVP. He is a Visiting Scholar at the Massachusetts Institute of Technology in the science, technology and society program where his research and teaching focus is the teaching of engineering to high school and undergraduate students.

Roger Strukhoff (Moderator)
EOS Power Panel

TRACK: General Session

Roger Strukhoff is Group Publisher and Editorial Director of SYS-CON Media. He spent 15 years with Miller Freeman Publications and The International Data Group (IDG), then co-founded CoverOne Media, a custom publishing agency that he sold in 2004. His work has won awards from the American Business Media, Western Press Association, Illinois Press Association, and the Magazine Publishers Association. You can read his blog at "rssblog.linux.SYS-CON.com" and contact him at roger(at)sys-con.com.

Yuval Tarsi
Web 2.0's Impact on Business: The Consumerization of Enterprise IT

TRACK: Web 2.0/AJAX and SOA

Co-founder and VP of research and development, Serendipity Technologies, Yuval Tarsi has broad startup experience, most recently as vice president of research and development and Israel Site Manager for ©Right. Previously, he served as vice president, research and development, and vice president of technologies at Trivnet, a provider of e-commerce and m-commerce solutions. Prior to that, Yuval served in the Israeli Intelligence Corps' prestigious "Haman Talpiyot" program. He holds a BSc in mathematics and computer science from Tel Aviv University.

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Speakers

David Temkin
EOS Power Panel & Presentation & Demo by Laszlo Systems

TRACK: General Session

A globally recognized pioneer of Rich Internet Applications, David Temkin is CTO and Founder of Laszlo Systems. In this role, he has positioned the company to become the next technology standard for Rich Internet Applications. Under his direction, Laszlo developed its patent-pending open source product suite and extended operations to both coasts of the United States. Before founding Laszlo, David was senior director of engineering at Excite@Home, where he led a team of 55 engineers, designers, and technical writers responsible for developing the company's consumer software. Prior to Excite@Home, he was an engineering manager in the Newton division at Apple Computer and developed enterprise software at EDS. He graduated from Brown University with a double major in computer science and history, and is named on four software patents.

Ian Thain
Model-Driven SOA

TRACK: Real-World SOA

Ian Thain is a senior technical evangelist/software engineer in the Worldwide Marketing Organization of Sybase, Inc. For over six years, he has worked with many engineering teams, including the Sybase WorkSpace product, and is a dedicated technical expert, continually working with Sybase's key partners and clients to enhance the capabilities of the solutions that Sybase can offer to its customers. Ian regularly addresses technical audiences all over the world, providing technical knowledge. He also writes whitepapers, demos, and articles for various Sybase products and is published in journals such as PowerBuilder Developer's Journal from SYS-CON Media.

Doug Tidwell
From Models to Forms: Building Applications Around XForms

TRACK: Web 2.0/AJAX and SOA

Doug Tidwell is a Senior Software Engineer at IBM. He was a speaker at the first XML conference in 1997, and has spoken on technical topics around the world. He works in IBM's Software Strategy group, evangelizing emerging XML standards such as XForms, SCA and SDO. He is the author of O'Reilly's XSLT, and has written many articles on IBM's developerWorks site and elsewhere on the Web.

Mark Tsimelzon
Event-Driven SOA with Complex Event Processing

TRACK: Hot Topics

A graduate of Mathematics and Computer Science from Massachusetts Institute of Technology, Mark has proven himself as an entrepreneur and technology innovator. Prior to joining Coral 8, in 1998 Mark founded a Web integration and personalization startup CallTheShots, Inc., which was acquired by Akamai Technologies in 2000. During his two years at Akamai, Mark led the design and architecture of their 'Edge Computing' strategy and platform and was also responsible for major partnerships with IBM, Oracle, Microsoft, Vignette, ATG, and other technology vendors. Akamai's Edge Computing is the largest distributed computing platform of its kind, comprised of 15,000 hosts across 65 countries. Mark also has a diverse development and management background amounting to key product releases at CETR, Eclipse International, Teknekron Software Systems (now TIBCO), and Mystic River Software. He also did research in scalable distributed systems at Stanford University.

Hub Vandervoort
Messaging-Oriented ESB: The FTP killer

TRACK: Interop, Standards & Services

Hub Vandervoort, CTO, enterprise infrastructure, Progress Software, has more than 20 years of experience as a consultant and senior technology executive in the networking, communications software, and Internet industries. Previously, Hub was vice president of strategic services for Sonic Software. Prior to Sonic Software, he co-founded three start-up ventures.

Alex Vasilevsky
The New Economics of Virtualization

TRACK: Virtualization

Alex Vasilevsky brings more than 20 years of extensive engineering, technology leadership and management experience to Virtual Iron Software. As a co-founder, he has been instrumental in defining and creating the technology and architecture behind Virtual Iron, and holds five U.S. patents for his innovative work in parallel processing.

Jeff Walker
Building SOA-Compliant Business Logic without Programming

TRACK: Real-World SOA

Jeffrey L. Walker founded TenFold in 1993. From TenFold's inception to October 1996, he was chairman, president, chief executive officer, and chief technology officer. Before founding TenFold, he was an independent consultant from 1991 to 1993. From 1985 to 1991, Jeffrey held several management positions at Oracle Corporation. He was the designer of Oracle's applications products and founder of Oracle's Applications Division. Before joining Oracle, he founded and was chief executive officer of Walker Interactive Products, an applications software company, and was the designer of Walker's products. Jeffrey holds a BA in mathematics from Brown University.

Jeffrey Walker
Wikis and the Lightweight Software Movement

TRACK: Hot Topics

Jeffrey Walker is president of Atlassian Software Systems in San Francisco. He leads the company's sales and marketing, and the U.S. organization. With over 5,500 customers worldwide, Atlassian is revolutionizing the way software is sold and used by businesses. Four years ago Atlassian introduced JIRA, which is now the most popular issue tracker used for IT project management. Prior to Atlassian, Jeffrey held CEO and president roles at Accrue Software, ICplanet, and Planmetrics. Formerly, he managed businesses for CSC Index, the management consulting company.

Roland Wartenberg
Virtualization Leverages Enterprise SOA

TRACK: Virtualization

Roland Wartenberg started his IT career as a consultant with Digital Equipment from 1991 to 1997. He has been with SAP since 1997. He was a development manager with SAP Markets, Palo Alto, from 2000 to 2002. From 2003 to 2005 he lent his multiple skills to the position of product manager for Adaptive Computing with SAP AG in Walldorf, Germany. At the end of 2005 Roland took over new responsibilities as an evangelist for SAP's Platform Ecosystem at SAP Labs, Palo Alto, California. He has been working on SAP's virtualization strategy since October 2006. He has made more than 200 public presentations during the past few years. He holds a Dipl.Ing. in electrical engineering.

Tony Wasserman
Best Practices for Open Source Evaluation and Adoption

TRACK: Enterprise Open Source

Anthony I. (Tony) Wasserman is director of the software management professional MS program at Carnegie Mellon West and executive director of its Center for Open Source Investigation (COSI). He was a co-founder of the Business Readiness Ratings project and serves as its chair. Previously, Tony was VP of Bluestone Software (acquired by HP), responsible for its open source J2EE middleware toolkit for mobile devices. Before that, he was founder and CEO of Interactive Development Environments, Inc. (IDE). Prior to starting IDE, Tony was a University of California professor, where he and his research team developed and released the User Software Engineering tools under the BSD open source license in 1981. He earned a Ph.D. in computer science from the University of Wisconsin - Madison and a BA in mathematics and physics from the University of California, Berkeley. He is a Fellow of both ACM and IEEE. He has written more than 60 papers and edited eight books.

Coach Wei
Enterprise Web 2.0 Reference Architecture – AJAX, SOA, and Open Source

TRACK: Web 2.0/AJAX and SOA

Coach Wei is chairman and CTO of Nexaweb technologies, an Enterprise Web 2.0 software company. Before founding Nexaweb, Coach architected and designed software for managing storage networks at EMC Corporation. As a champion for open source and open standards, he is the author of the open source word processor AjaxWord, a committer at the Apache XAP project, and a member of the OpenAjax Alliance steering committee. An accomplished writer and speaker, Coach has published numerous articles on topics including: AJAX, J2EE and .NET, RIA development, XML, signal/image processing, composite materials and ultrasonic imaging. Coach obtained his master's degree from MIT, holds six patents and maintains his "Direct from Web 2.0" blog at http://www.coachwei.com.

Michael Wheaton
Decorating Your SOA Services with Governance Enforcement Contracts

TRACK: Interop, Standards & Services

Michael Wheaton is principal engineer for Sun Microsystems with 15-plus years of experience in the computer industry. He is a subject matter expert in service-oriented architectures and is responsible for driving vision, training and the development of customer solution offerings around SOA. For the past nine years at Sun, Michael has led and mentored key Sun customers on the integration of evolving technologies into the corporate enterprise. As chief architect, he has led projects across a wide range of vertical markets with some of Sun's largest customers. He is a frequent speaker at a wide range of events.

David Wood
Improving Customer Experience Through SOA and Web 2.0: A B2B Telecom Use Case

TRACK: Web 2.0/AJAX and SOA

Dave Wood has over 20 years of IT experience and has delivered a wide range of solutions based on ERP, CRM and Web-based technologies. Dave has been with BT for over three years working on a number of Web-based initiatives and strategies. The last 12 months have been focused on delivering the customer portal for BT's new Openreach organization.

Raven Zachary
Going Open – A Guide for Software Vendors and Their Customers

TRACK: Enterprise Open Source

Raven Zachary covers open source technology for The 451 Group. This includes coverage of both industry and community issues, as well as the new Commercial Adoption of Open Source (CAOS) Service. Prior to joining The 451 Group, he was the senior technical editor and consulting industry analyst for Enterprise Open Source Journal, and the editor of The Open Source Update, an open source industry newsletter. He was also the principal of o*rev, an enterprise open source consulting firm working with enterprise IT and software vendors on open source strategy

Jack Zubarev
Deep Dive into OS Virtualization Technology

TRACK: Virtualization

Jack Zubarev is a founder and COO, overseeing worldwide sales and operations at SWsoft, maker of virtualization and automation software. Jack has helped build SWsoft from its start to today with more than 600 employees. Since 1999, he has held leadership roles including sales engineering, product marketing, and business development.

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