

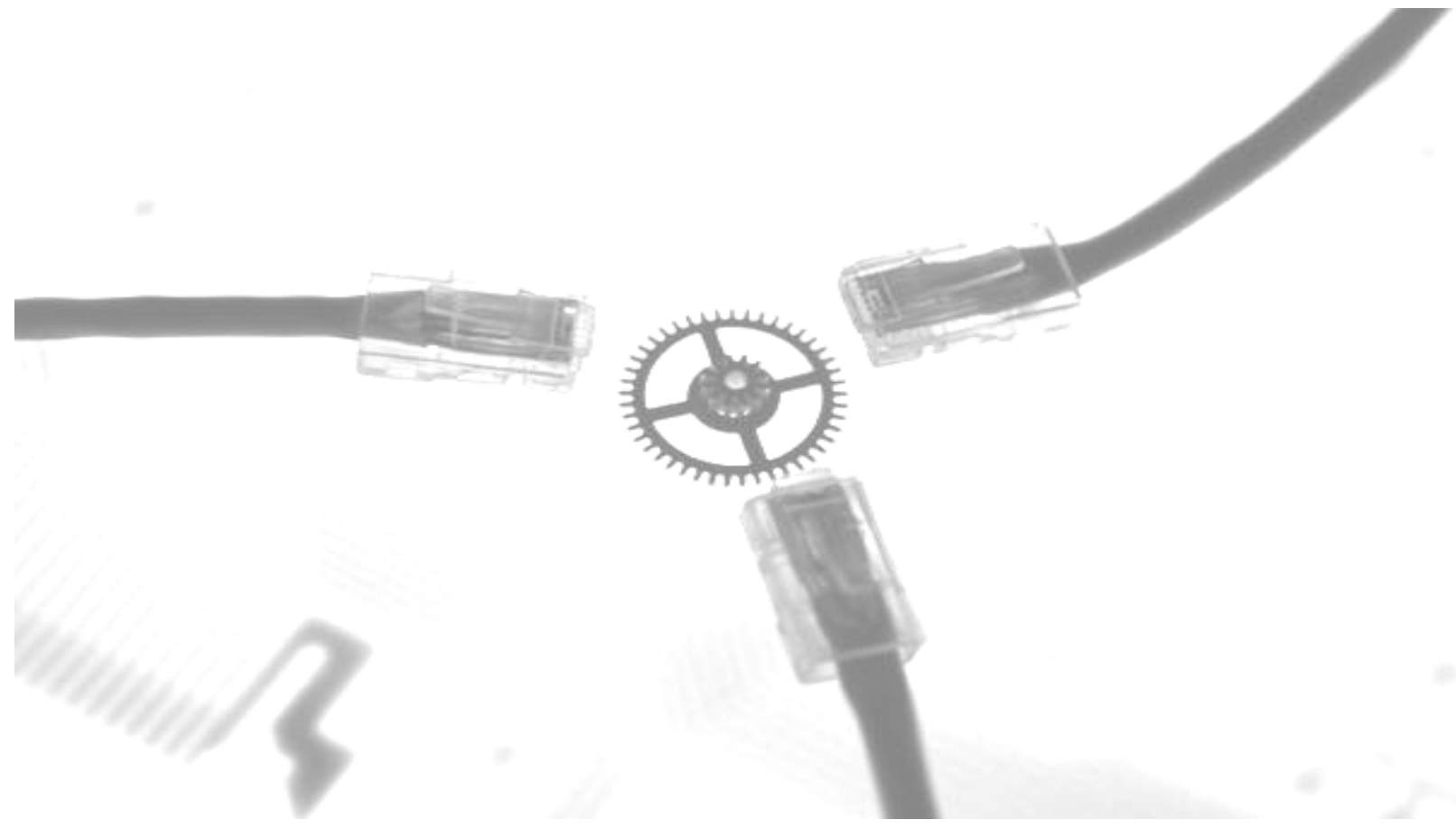
IONA Technologies

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# Service-Oriented Integration: A Strategy Brief

Peter Cousins, Technical Director  
Ivan Casanova, Product Manager



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***Our current technology challenges are well known, and how to overcome them has been the burning question driving the best and the brightest minds in the software industry for years. Realizing that the current practices have little room for incremental improvement, the solution is a fundamentally new approach that promises to dramatically reduce cost and complexity.***

## Abstract

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This paper discusses a next-step standards-based approach to reducing the liability of heterogeneous IT systems called “Service-Oriented Integration” that lowers the cost and complexity of IT operations by improving the flexibility of deployed systems. This new approach goes beyond integration, to enable consolidation and rationalization of technology assets while eliminating roadblocks that stifle business innovation.

## “A Perfect Storm”

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A perfect storm of rapid business evolution and a non-integrated approach to technology has left the IT operations of most large enterprises struggling against a rising tide of costs and complexity.

Enterprises were buffeted by Y2K emergency preparations, immediately followed by an urgent need to compete on the web, and then a fierce economic climate. With so much strategic energy dedicated to these challenges, it was inevitable that ordinary projects would be forced to wait in a growing backlog queue or proceed with a non-strategic and divergent set of compromises.

The rigid environment that results from constant compromise can only strain and crack as business change gusts against the sail. There are a number of tools available that have been offered as a panacea, but they are not sufficient for the actual solution, they are just the necessary tools.

The desire for business growth and competitive advantage has been a primary driver that has fueled much of the technology spending in the past twenty years. These goals are difficult to express and measure, and as a result, most of the projects have been defined in strictly functional terms, such as “we need our website to provide electronic commerce features”, or “our customer service representatives need information on cross-selling opportunities.”

The first obstacle to delivering on these objectives was the inability of applications to even talk to each other. In the late 90's integration server software promised the fastest possible way to get incompatible applications to work together.

Unfortunately, while probably most expedient, it was not the most strategic way to integrate the enterprise, because it only perpetuated the problem. The implementation costs for these projects went way beyond initial projections—analyst research has shown the average cost of

implementation for these projects at \$6-10 million dollars (US)—and these projects have proved to be the most costly to change or alter after initial deployment.

In this third year of lowered corporate capital spending, technology and business executives are looking for new ways to cut costs and streamline operations. The focus of our best thinking is no longer application features, but how to fundamentally reduce costs and increase agility.

One approach often considered for reducing cost and complexity is replacing legacy environments with lower cost alternatives such as J2EE. However, even organizations that aren't troubled by the complexity and unproven scalability of J2EE know that the "rip and replace" approach is difficult to justify. The cost of building from scratch and retraining staff is enormous, and the business risk of replacing production applications with unproven code is unacceptable.

So how do organizations navigate through this perfect storm? Not by battening down the hatches, nor manning the lifeboats. It will be through clear thinking and unwavering focus on a beacon on the horizon.

## A Brief Summary of the Industry's Best Thinking

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Our current technology challenges are well known and how to overcome them has been the burning question driving the best and the brightest minds in the software industry for years. Realizing that the current practices have little room for incremental improvement, the solution is a fundamentally new approach that promises to dramatically reduce cost and complexity through:

- ❑ **Disintermediation** of systems to eliminate the costs and degradation of service that are intrinsic to intermediaries
- ❑ **Definition** of the computing environment in a standard way to facilitate discovery, understanding, evolution and management

- ❑ **Separation** of technology decisions and implementation from the more fundamental business processes defined by the environment
- ❑ **Commoditization** of computing, connectivity, and interoperability technology facilitated by this separation
- ❑ **Migration** away from proprietary technologies to standard, technologies that are widely adopted and understood
- ❑ **Innovation** that results because standardization removes unnecessary technology barriers to collaboration both within and between companies

Both technology and business executives need to understand the basic principles behind these ideas, so that they can help guide the decision making process to include not just feature and function discussions, but also the strategy and design discussions necessary to reap dramatic gains.

### **Background on Service Oriented Architecture**

Service Oriented Architecture (or SOA) is an idea born by early component-based distributed computing efforts and made real with the availability of widely adopted specifications put forth by pioneers such as the Object Management Group and early adopting vendors such as IONA Technologies. CORBA, along with Microsoft's COM programming model, brought SOA development to corporate programmers in the 1990's, SOA proliferated further with the release of the Java programming language, EJB component model and the maturation of the J2EE application server market.

In theory, the idea is compelling in its simplicity. If you can wrap an application with well-defined interfaces, it is possible to turn that monolithic application into a set of "services". This wrapping process creates an abstraction layer that hides all the complex details of the application - no longer do you care what language, operating system, or

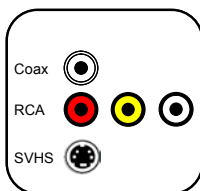
database the application uses. The only thing that matters is the interface that describes the service.

The benefits of SOA are well documented and include greater reuse, more flexibility, and better scalability and availability. Fifteen years into this revolution in software architecture, SOA has delivered on the promise of advanced productivity for application development projects.

But first attempts at SOA only addressed the development of new business logic and only provided limited capabilities in addressing the vast majority of systems that were not built using service oriented principles. In addition, competition and innovation meant there were multiple, disparate SOA implementations that were not very easily integrated.

It is not enough to provide a solution that requires universal adoption to reap the benefits. There must be serious accommodation for real world diversity, and to this end, multiple vendors have come together to provide a better framework for SOA by heeding the lessons of earlier attempts. These broad efforts manifest in various “Web Services” technology standards.

### **Understanding SOA: The Component Ecosystem of your Television**



A real-world example of service orientation can be seen on the back of your home television set. The coaxial jack on your set is the service interface (standards based, universal) and the inner-workings of the TV are similar to the business logic of your applications. The common standard of coaxial enables television studios to publish content on the wire and know that any device connected through the cable or satellite systems will receive the video in a well understood way.

If that were all, it would be a significant mass-market phenomenon, but there are additional implications. VCRs receive the signal in the same way as the television, but instead of displaying it, store the video stream

onto tape to facilitate freedom of playback and fast-forwarding. VCRs can then give way to digital video recorders that display sophisticated programming guides and allow real-time pause or rewind. Televisions didn't change to accommodate a video recording platform, and don't change when the platform is completely replaced.

Video games produce signals that are the same as regular broadcast signals, but allow interactive games to use the television display. DVD players upgrade the fidelity of the picture, and support the old standard, plus a new "S-Video" standard with a better quality of service. New digital cable boxes include S-Video jacks to take advantage of this, but still offer coax or RCA.

Today, new televisions come with multiple S-Video, RCA, and coax jacks. It is simple to include many commodity connections on the new unit, and the minor additional expense is dwarfed by improved convenience and interoperability. Each connection type has unique market and functional advantages, and all three will be on the back of the television and the related ecosystem of components for a long time.

This is how the next generation of SOA for information systems will help address the cost and complexity plaguing enterprises today; and just as video recording was added without throwing out the television, enterprises won't be required to throw out valuable IT assets. While previous generations of SOA offered the strange choice of selecting coax, RCA, or S-Video for the entire enterprise, the emerging standards embrace diversity to make them the practical choice, and ready for business.

## **Service-Oriented Integration**

Service-Oriented Integration is the combination of traditional integration objectives coupled with the open, flexible enabling capabilities of Web Services. Service-Oriented Integration provides an abstracted interface with which systems can interact, rather than using low-level protocols and proprietary programming interfaces to define how systems talk to

*“SOI simplifies integration by providing an architectural framework based on Web Services in which to build, deploy, and manage build, deploy, and manage system integration” ...*

*Zap Think Research – 2003*

one another. Systems merely need to be exposed as Services, and other systems that choose to interact with them can simply discover those services and bind to them at runtime or design-time.

Businesses own applications dating back generations that are still useful but can't be re-used since they lack modern interfaces. This presents a challenge to IT organizations needing to adapt to new user communities and access methods, such as the Internet or higher productivity desktop environments such as .NET.

Service-Oriented Integration enables IT organizations to offer the functionality in existing applications as reusable services.

### **How Does SOI Go Beyond Web Services?**

Web services are modular software applications, built to run over the Internet, and based on open standards for definition, discovery, and interoperability.

Service-Oriented Integration simplifies system integration by providing an architectural framework for building, deploying, and managing integration, using the same set of standards that enable “basic” Web Services.

Albeit similar, Service-Oriented Integration goes beyond “basic” Web Services since it requires features appropriate for large scale, enterprise application integration.

**Service Enablement.** Service-Oriented Integration exposes existing systems through standard interfaces. Because these existing systems are production business application, they cannot be altered and Service-Oriented Integration must support non-invasive service enablement.

**Multi-Transport Support.** The Web services specifications do not mandate a specific transport, although it is a common misconception

that Web services travel only over HTTP transports. In reality both WSDL and SOAP specifications both discuss multiple transports.

Service-Oriented Integration solutions must incorporate disparate enterprise architectures, which include multiple enterprise backbones such as MQSeries, CORBA, Tuxedo, TIBCO, JMS, and others. Therefore, robust support for these proven backbone protocols must be a cornerstone of Service-Oriented Integration solutions.

**Security.** Increasingly, security is an issue when companies evaluate technologies for enterprise integration. Typically resources to be integrated have their own security models, designed at the time of development. To make Service-Oriented Integration viable for integration, Service-Oriented Integration must support the role-based access control, single sign-on, secure exchange between service consumer and provider and must integrate with existing enterprise security systems.

**Transactional Support.** The approved Web services standards do not specify a model for transactions. Although much like security and other enterprise features a number of competing specifications have been drafted to define a Web service transaction model.

To drive adoption by enterprise customers, Service-Oriented Integration must support transactional semantics including features such as commit and roll-back.

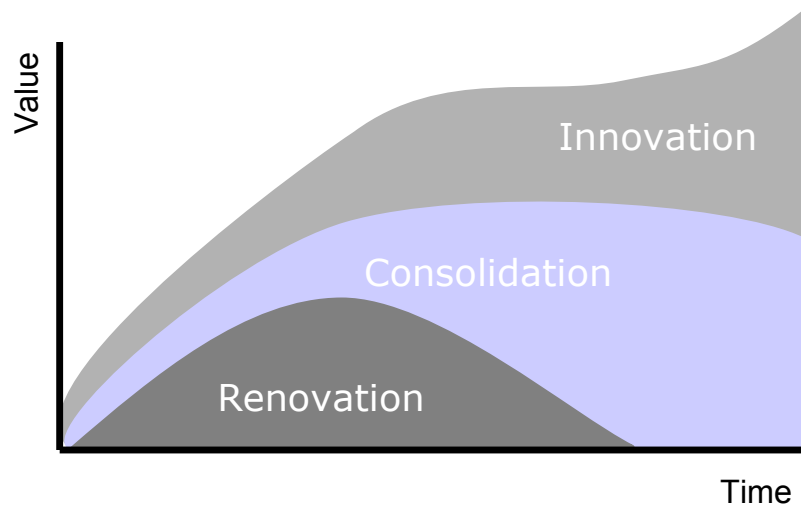
One such submission was led by IONA in partnership with Sun Microsystems, Oracle and others [for more information visit <http://www.iona.com/devcenter/standards/WS-CAF/>].

**Conversational Interactions.** Many enterprise systems are based on conversational interactions between clients and servers because they are more efficient for mission-critical systems. To scale, Service-Oriented Integration needs to support conversational interactions.

## Incremental Steps Create Lasting Value

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Integration can be the first step towards untangling complex IT operations, but integration alone does not address the more systemic problems of the high costs and complexity of IT operations. To address these challenges and to eventually achieve sustainable business value, corporations must begin moving towards Service-Oriented Integration, because this is the only approach that solves your most pressing needs today and is just as strategic for the future.



### First Step - Renovation

Application renovation is the restructuring of application components so that they can be recombined or reconfigured to solve new business challenges. In addition to liberating business logic from legacy applications, application renovation can increase IT responsiveness to business needs, and can help organizations take advantage of new market opportunities.

Adding new web based clients or adding features to a business system will address near-term integration needs, but system renovation can both remove integration roadblocks and extend the value of the asset for the future.

Many styles of integration can be used to integrate IT systems, but only Service-Oriented Integration can provide sustainable business value.

### **Next Step – Consolidation**

Consolidation is a key focus area for CIO's of large enterprises. Against a background of economic downturn, consolidation offers the potential to cut costs, cut complexity and establish a sound foundation through which the IT organization can add real business value.

The loosely coupled links between systems created through Service-Oriented Integration enable business logic to be migrated from aging expensive platforms to lower cost, strategic alternatives. Service-Oriented Integration breaks the dependencies between system components and applications and enable the seamless migration and consolidation of IT assets.

### **Innovation Unleashed**

Up to 80% of corporate IT budgets go to support and maintenance of existing assets. That only leaves 20% of the budget for creating business advantage. To achieve sustainable business value from IT, executives need to lead their enterprises to move beyond monolithic architectures, and towards a service oriented integration model.

Service Oriented Integration is a standards-based approach to describing software systems and their interactions. Standards always drive adoption; this can be seen across every business. The reason that the Web has become the global conduit for commerce and communications is that users know they can access new information regardless of how it was built and where it physically resides.

The same model is now possible for corporate information networks. No longer will technology implementation dictate how users and systems interact with business applications. The details of a master customer file, purchasing system or CRM system can be hidden behind a self-describing service interface.

Service Oriented Integration does more than help fix the problems of the past. As you innovate to pursue new business opportunities, it provides a model for avoiding these pitfalls in the future.

The business innovation is economic, not just technical. Where before technology lock-in shackled corporate IT, to decisions made long ago (and their accompanying support and maintenance charges), Service-Oriented Integration will enable IT assets to be deployed on the lowest cost platforms using the lowest cost tools.

Regardless, the business process and dependencies between users and systems must move to a service contract model. Once the implementation costs and ongoing support and maintenance burdens are alleviated, strategic investment can be funded with the savings. Only when this inversion of support versus strategic spending occurs will innovation be truly unleashed.

## IONA's Strategy – Introducing Artix

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IONA's proven track record of scalable, high-performance standards-based middleware validates the Artix approach to service-oriented integration while bringing to bear the experience of serving over 4,500 customers who run the most demanding IT systems in the world. IONA's software solutions are used to unify corporate IT infrastructures that connect business applications and middleware subsystems from various vendors into a coherent strategic federation.

IONA researched its customer base, asking them what kind of IT challenges they faced and what strategies were in place to help achieve sustainable systems agility and lower operating costs.

With this research in hand, IONA's engineering organization went to work. The result is Artix, the evolution of ORBIX and the world's first true enterprise-class, Service-Oriented Integration platform.

### **What is Artix?**

Artix is a family of service oriented integration products that renovate existing IT assets and consolidate legacy middleware to reduce the complexity and cost of IT operations while enhancing future IT innovation.

- ❑ Artix helps extract additional value from IT assets through the re-use and renovation of existing systems
- ❑ Artix improves business execution by removing immediate system integration roadblocks and consolidating disparate systems and aging infrastructure.
- ❑ Artix unshackles IT innovation by enabling service-oriented computing -- the best of standards-based middleware and enterprise-class Web services.

Artix embraces the fact that typical IT enterprises are distributed and heterogeneous. Artix provides the distributed computing glue that allows disparate middleware and systems to transparently work with each other, thus allowing you to incrementally encapsulate and abstract your existing investments into a network of cooperating, flexible, evolvable services without requiring expensive "rip and replace" or custom coding approaches.

## Contact Details

### IONA Technologies PLC

The IONA Building  
 Shelbourne Road  
 Dublin 4  
 Ireland  
 Phone +353 1 637 2000  
 Fax +353 1 637 2888

### IONA Technologies Inc.

200 West Street  
 Waltham MA 02451  
 USA  
 Phone +1 781 902 8000  
 Fax +1 781 902 8001

### IONA Technologies Japan Ltd

Akasaka Sanhome Building 7/F  
 3-21-16 Akasaka  
 Minato-ku, Tokyo  
 Japan 107-0052  
 Phone +813 3560 5611  
 Fax +813 3560 5612

**Support** support@iona.com  
**Training** training@iona.com  
**Sales** sales@iona.com  
**FTP** ftp.iona.com  
**WWW** www.iona.com

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## Artix Products

The Artix product family can be used individually or in concert as the foundation of Artix based solutions.



A middleware interoperability product, Artix Relay eliminates roadblocks that slow down innovation



An Enterprise Web Services product, Artix Encompass enables rapid creation of Web services applications with enterprise features, enabling IT assets to be re-used in service oriented computing



Enables the non-invasive exposing of mainframe transactions as Web services, enable mainframe assets to be re-used in service oriented computing

For more information on Artix or to have a visit from IONA technical and sales personnel – go to [www.IONA.com/Artix](http://www.IONA.com/Artix) and request a briefing.