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Message Driven SOA -- Enterprise Service Oriented Architecture

Standards-based Web-Services Integration

Reducing Integration complexity and development costs

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STANDARDS-BASED WEB-SERVICES INTEGRATION

Reducing Integration complexity and development costs

Executive Summary

Web Services is a standards based approach for B2B connectivity. The fundamental value of Web Services lies in providing standards based method of accessing both packaged as well as legacy systems. However, merely getting access to data from individual applications is only the beginning.

Real productivity increases and value are only created by effectively orchestrating business processes that span multiple enterprise applications, both within and across the firewall. The value of standalone Web Services thus pales into insignificance when compared to the value created by dynamic business processes that span multiple Web Services.

For instance, a Web Services approach can let an order-entry application borrow a function or two from a credit check application that was originally created for the Finance department, so that the IT department doesn't have to replicate work that's already been done and can tap into existing databases that have already been assembled. This simple example of how a Web Services based Business Process can facilitate re-usability of a Business function within an Enterprise. Let's extend the same example to a related scenario where a retailer or a reseller of the same company wants to run a credit check for a customer while selling a product or a commodity. The Business's retailer can now simply invoke the same web service over the firewall even if their own systems are based on Microsoft technologies while the other businesses systems run on Oracle.

It is easy to see the benefits of Web services in Supply Chain Management (SCM) and Customer Relationship Management (CRM) integration efforts. Accessing Web services from suppliers for product pricing, availability, and order management as well as exposing these same functions to customers can greatly increase the visibility and efficiency of an organization's supply chain. Similarly, within a CRM solution, Web services can support easy alerts regarding order status on any device, helping companies improve customer service.

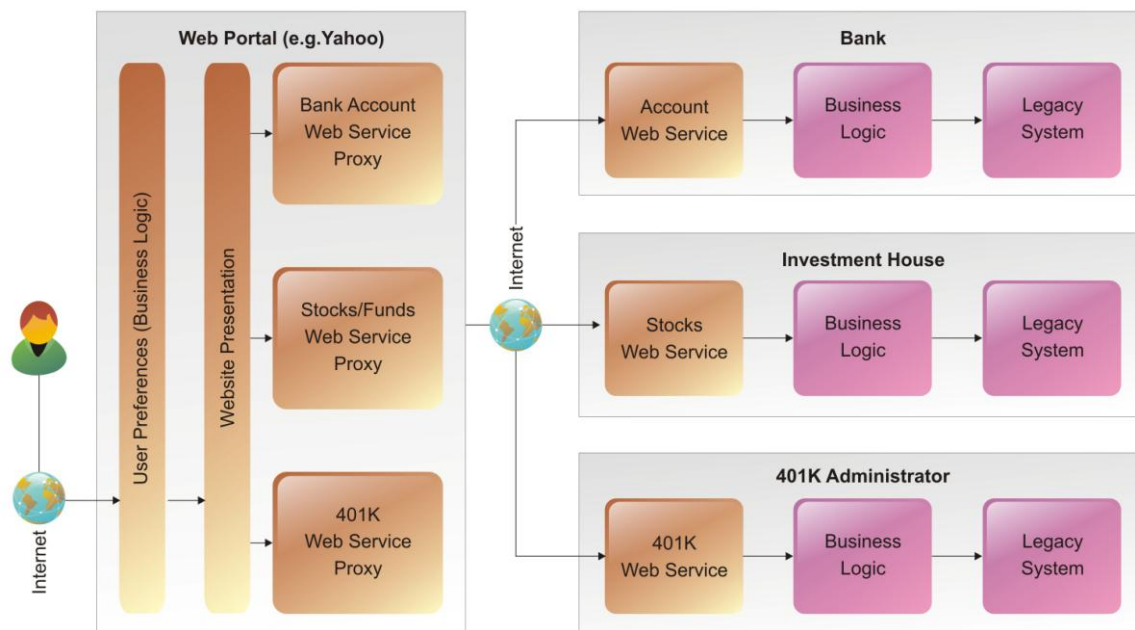


Figure 1: Sample Web Services Usage*

Figure 1 above shows a sample Web Service solution that lets a user view his consolidated financial statements. The Web portal uses Web Service proxies to securely integrate with the various financial institutions to get the actual account information for the user. The information is then aggregated and displayed to the Website Portal user as required. The user need not know how the information is being collected from various sources, just that it shows an accurate, consolidated view.

Thus, software infrastructure and tools that allow disparate Web Services to be loosely coupled together into a single distributed business process become of primary importance. Such infrastructure needs to provide inbuilt support for monitoring, efficient data routing, dynamic deployment of services, centralized management, service versioning and configuration management, among other features. The infrastructure should enable loose-coupling of services, together with support for a component model allowing the easy creation of tools for business process composition and deployment. As described in the next section, such infrastructure is ideally based on service oriented architecture.

Why Web Services

Web Services combine the unique aspects of component-based development and Web infrastructure, delivering many benefits for both intra-enterprise interactions and for interactions with customers, suppliers and partners over the web. Web services revolve around three standards:

- Simple Object Access Protocol (SOAP)
- Web Services Description Language (WSDL)
- Universal Description, Discovery, and Integration (UDDI).

These standards provide the mechanism for exposing, discovering, and accessing business logic on the Web as services. Some of the benefits provided by Web Services can be summarized as below:

- Web Services provide an ideal way to expose business processes/functions as automated and reusable interfaces
- Web Services offer a uniform mechanism for enterprise resources and applications to interface with each other
- Web Services help leverage existing software investments by allowing a business function/process wrapped in a Web Service interface to be replaced without impacting the consumers of the Service

Web Services and SOA

Service Oriented Architecture (SOA) is not so much a revolution, as an evolution in the model for developing software. The basis for the SOA model is the knowledge derived from lessons learned over decades of costly, proprietary software development.

In simple terms, service-oriented architectures provide a standard programming model that allows software components, residing on any network, to be published, discovered, and invoked by each other. SOA software programmers can both build services that are offered as components to anyone, anywhere via a computer network. This means that any distributed service application can interact with any other service-based application regardless of either's network location.

The Service based architecture establishes a more durable Services layer, where the integration point is the Service specification, not the implementation. This provides implementation transparency, where multiple implementations may be rationalized, or an older implementation upgraded, with minimal impact on the consumer of the Service. This establishes a loosely coupled architecture of services that have minimum dependencies and maximum platform independence that can be reused with minimum cost overhead.

SOA is the broad set of concepts that enable units of functionality to be provided and consumed as Services. This essentially simple concept can and should be used, not just for Web Services, but also at each tier of the architecture, in order to compartmentalize and provide flexibility.

“Web services can be the catalyst for the creation of service-oriented architectures. By letting applications access data across different devices, operating systems and locations, Web services bring the real-time enterprise a step nearer.”

Whit Andrews, Research Director, Gartner Research

Fiorano’s products are based on a service-oriented architecture where loosely coupled software services can be easily and quickly integrated. Fiorano enables a simpler, affordable and scalable approach that enables Component-based Business Process Composition. Using the notion of coarse grain programming techniques to create a palette of reusable components, the creation, prototyping, production and ongoing management of composite applications can be made as simple as manipulating numerical macros in a spreadsheet as used today.

Fiorano ESB for Orchestrating Web Services

To successfully leverage the power of Web Services, enterprises require a platform that delivers comprehensive support for Web Services Orchestration including deployment, monitoring and integration. Enterprises not only need to develop new Web Services Applications but also integrate their back-end business applications in the Web Services architecture. In addition to development and integration, Business and technical users need to have comprehensive monitoring and Deployment capabilities to ensure reliable Business operations.

Fiorano ESB (Fiorano Enterprise Service Bus) provides the ability to create business processes by orchestrating Web services using visual drag-and-drop tools. This is extremely vital for achieving flexibility in a dynamic environment. Fiorano Enterprise Integrator is built on top of Fiorano ESB and provides enterprises with a unified solution for deploying, monitoring and integrating Web Services.

Following are the unique components of Fiorano’s Web Services solution.

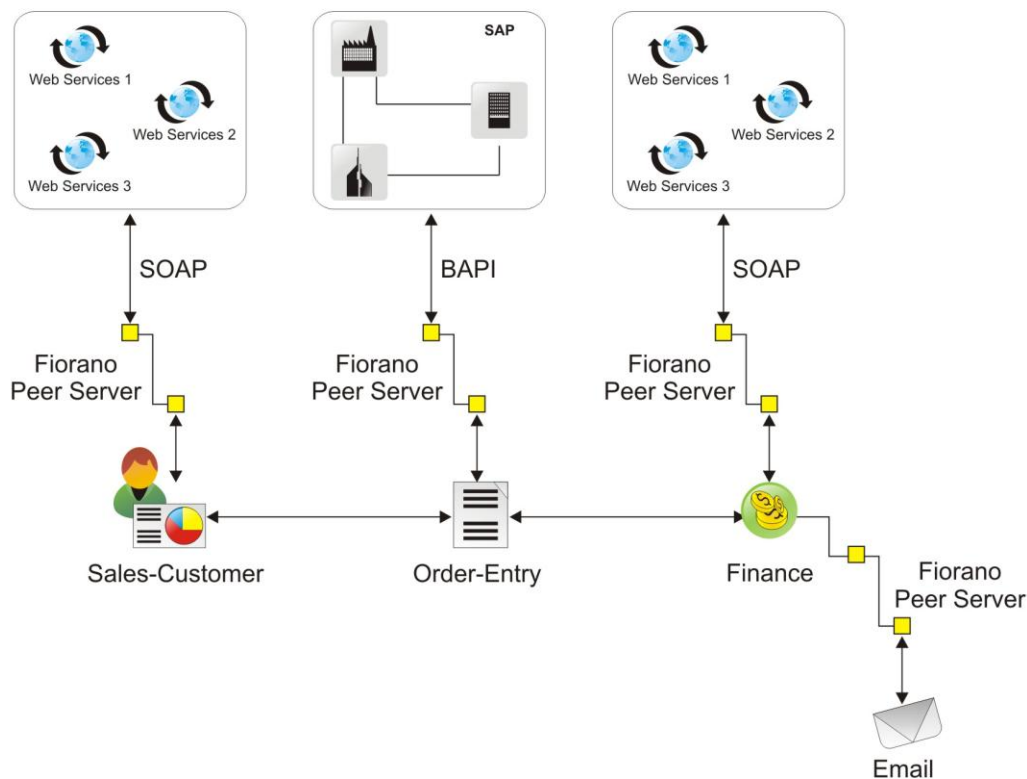


Figure 2: Fiorano ESB: Web Services Orchestration

Web Services - Monitoring

Fiorano ESB provides comprehensive support at both the infrastructure and Tools level to monitor Web Services running over the entire network from any Fiorano ESB node on the network. This combined with event-based notification of critical errors in business flows provides Enterprise users with unmatched capabilities for monitoring Web Services and other legacy services. Using Fiorano ESB, developers can debug live data-flows via break-points on distributed queues; dynamically change trace levels for debugging components and business processes.

Web Services – Data Routing

Participating Web Services in a Business Process within the Fiorano ESB framework are completely oblivious to the routing of data between component-instances. That is, there is no notion of a transport-layer at the component level. Instances of the same component can easily be reused in different distributed applications because each instance is completely independent of and has no dependencies on other instances of the same component. Data routing being external to the component-instance itself, allowing easy reuse of components across applications.

Web Services – Deployment

Fiorano Enterprise Integrator built on top of Fiorano ESB provides comprehensive support for remote deployment and upgrades of Web Services across the distributed network. Clear separation of the configuration and runtime engine of each component, allows remote configuration of components.

Web Services – Management

Fiorano ESB employs a brokered P2P architecture; key operations such as component execution, data-routing, workflow processing and data transformation/translation are performed at the network end-points. Centralized servers perform other operations, such as Management, event-handling, security authentication and administration. Distributed processing and data routing leads to better scalability while centralized controller provide single-point administration and management to the entire set of Web Services and other components taking part in the business process, defining rules for coordination within and across business units.

Web Services – Configuration & Version Management

Fiorano ESB provides visual drag and drop Tools for managing multiple versions of Web Services, allowing version upgrades to be driven from a centralized management tool. Component state labeling (Development, QA, Staging, Production), combined with the labeling of network end-points give deployment engineers control over the classes of components running on a particular hardware systems within the network, allowing unparalleled deployment flexibility unmatched by other platforms.

Web Services – Standards-Based Security

The widespread acceptance of open-standards like HTTP, XML, SOAP, WSDL, and secure JMS, makes them an ideal foundation upon which to build Web services. Initially, services will make use of current technologies like firewalls, SSL and digital certificates to connect diverse locations that are either within the enterprise or located at trading partners. Next generation services will combine these proven technologies with new standards-based security technologies like XML encryption and XML digital certificates, which will provide more granular and optimized security measures.

Fiorano ESB contains a comprehensive set of security features that enable end-to-end secure communication between Web Services. Fiorano ESB's ACL-Based, J2EE and LDAP compliant security gives administrators fine-grained control over the execution of applications and services on machines across the network. Additionally, each Service can be digitally signed. Fiorano ESB also provides SSL-based transport level security, employing RSA and DSA encryption.

“A Web services provider platform hosts and provisions Web services for the enterprise, its partners and its customers. At the technological core of the platform is service-oriented architecture.”

Yefim Natis, Vice President and Research Director, Gartner Research

Delivering Real Benefits Today

Fiorano ESB thus offers a far more scalable approach with its Services Oriented architecture, decreasing costs with the reuse of each service (Web Service or even a legacy service). Unlike incumbent solutions which are a patchwork of products, Fiorano ESB provides a truly distributed architectural framework developed from ground up, delivering the following benefits to organizations:

- Fiorano ESB serves as an important foundation for creating flexible e-business platforms;
- Rapid deployment leads to accelerated time-to-market;
- Standards-based implementation provides Risk Mitigation and Vendor neutrality;
- Allows an enterprise to fully leverage their existing IT infrastructure investments;
- Reusability means lesser costs of customizing that reduces Integration costs dramatically;
- Entry-level costs are significantly lower than the competition;
- Architectural-level innovations enable a linear build-as-you-grow scalability, which ensures optimum performance that meets rapidly changing business demands;
- Fiorano's distributed solutions enable leveraging all the power available at the end- points of the network;
- Event driven architecture becomes a key enabler for B2B and B2C initiatives;
- Businesses can meet dynamic surges in demand without having to provision new systems, deliver undisrupted services and increase customer satisfaction.

All the above benefits add up to two important strategic advantages to an enterprise:

- Rapidly achieve Real Time competencies, making the enterprise inherently more competitive
- Tangible, incremental and fast Returns on Investment
- Develop agility in your enterprise today.

Contact us for a free evaluation of your needs at sales@fiorano.com or download free evaluation software at www.fiorano.com/downloads/

For more details on Fiorano ESB, please download Fiorano ESB datasheet from the following link:
http://www.fiorano.com/docs/fiorano_soa_brochure.pdf

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About Fiorano Software

Fiorano Software (www.fiorano.com) is a leading provider of enterprise class business process integration and messaging infrastructure technology. Fiorano's network-centric solutions set a new paradigm in ROI, performance, interoperability and scalability. Global leaders including Fortune 500 companies such as Boeing, British Telecom, Credit Agricole Titres, Lockheed Martin, NASA, POSCO, Qwest Communications, Schlumberger and Vodafone among others have used Fiorano technology to deploy their enterprise nervous systems.