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Message Driven SOA -- Enterprise Service Oriented Architecture

Meeting the application integration architectural challenge

Achieving high levels of scalability without complexity

--- Atul Saini

AMERICA'S
Fiorano Software, Inc.
718 University Avenue Suite 212, Los Gatos,
CA 95032 USA
Tel: +1 408 354 3210
Fax: +1 408 354 0846
Toll-Free: +1 800 663 3621
Email: info@fiorano.com

EMEA
Fiorano Software Ltd.
3000 Hillswood Drive Hillswood Business Park Chertsey Surrey
KT16 0RS UK
Tel: +44 (0) 1932 895005
Fax: +44 (0) 1932 325413
Email: info_uk@fiorano.com

APAC
Fiorano Software Pte. Ltd.
Level 42, Suntec Tower Three 8
Temasek Boulevard 038988
Singapore
Tel: +65 68292234
Fax: +65 68292235
Email: info_asiapac@fiorano.com

MEETING THE APPLICATION INTEGRATION ARCHITECTURAL CHALLENGE

Achieving high levels of scalability without complexity

Executive Summary

The democratization of computing power began in the 70's with a move from mainframes to client/server models. The second wave of evolutionary forces created networking standards, inexpensive memory and abundant compute power that led us into *the network is the computer* reality.

These infrastructure developments, however, are evolutionary steps towards an even more explosive change in how we interact and conduct our businesses in the future. A new wave of distributed applications and web services are being deployed over the networked infrastructure to enable a 'services-on-tap' applications usage model. There is another transformation underway as distributed applications become ubiquitous. In an age of *doing more with less*, the current developer-centric technology now needs to address the needs of simplicity demanded by business-users of that technology.

Business users need the elegance of visual drag-and-drop simplicity to create, monitor and alter their business processes. In an increasingly global 'anytime, anywhere' world, the ability of an enterprise to compete effectively resides in its ability to empower its decision-makers, employees, customers and partners to create, assimilate and react to rich information in real-time.

Since most enterprises have adopted a wide array of multi-vendor applications, the Enterprise Applications Integration (EAI) vendors have had a very successful run at integrating organizations with proprietary solutions. However, existing enterprise EAI architectures are built on a centralized hub that is integrated into distributed spokes to the edge of the enterprise. This hub and-spoke model is fundamentally unsuited for the increasingly greater enterprise requirements of performance, scalability, real-time responsiveness, security and most importantly - affordability.

The new proposed peer-to-peer architecture, a new paradigm in performance, scalability, simplicity and affordability can be used in conjunction with existing EAI infrastructures. It can be used to create new peer-to-peer EAI solutions that cater to a broad spectrum of enterprise requirements. This paper discusses benefits of a true Peer-to-Peer (P2P) EAI architecture and challenges in creating true P2P EAI architectures.

The Peer-to-Peer (P2P) Mystique

While the enterprise was getting wired and coming to grips with a new set of challenges regarding network security and the management of a new IT architecture, the *applications* that formed the core of an enterprise's business were also getting assimilated. Large Enterprise Applications Integration vendors have created non-trivial EAI infrastructures within enterprises to enable distributed application usage. These EAI implementations, typically at the core of an enterprise, have incurred large costs and grown in complexity driven by factors such as:

- The diversity of applications and unique data formats that need to be assimilated
- Middleware needed to ensure interoperability between multi-vendor applications
- Centralized hub-and-spoke architectures for data and control communication resulting in increased spending on the hardware at the hubs
- Customization requirements for adaptors that need to be written for each application
- Communication bottlenecks and single points of failure in existing hub-and-spoke architectures, which can only be overcome by adding multiple-hubs to create redundancy of routing, adding significant costs to the underlying infrastructure

A real-time enterprise requires its key decision-makers to be armed with the latest information needed to retain a competitive edge. These business-users, no longer confined to the corporate back-office, are tasked with the creation, management and dynamic modification of their business-processes.

They need to be empowered, at the edge of the network, with visual *information-spreadsheet-like* tools that can dynamically integrate services, interconnect them into workflows, and enable them to perform collaborative data exchanges in real-time - with no downtime penalties Traditional back-end hub-and-spoke EAI systems - by the very nature of their underlying architecture - are not ideally suited for the needs of a real-time enterprise. The current mapping of hub-and-spoke EAI enterprise networks on a distributed P2P network is a mismatch that limits a business-user from realizing the full potential at the application layer. Real-time enterprises are now demanding a peer-to-peer oriented EAI solution that leverages the underlying peer-to-peer networking infrastructure to get the highest returns on their investments.

A new breed of EAI solutions that address this need are a fall-out of the holy grail of distributed computing. However, delivering these solutions creates daunting challenges. One needs expertise in diverse areas including - Operating systems, visual programming, distributed computing, networking and messaging standards, close customer-feedback for several years to balance the fine-line between centralized and distributed resources, flexibility in driving and leveraging emerging standards, and coarse-grain component-level perspectives in programming.

Fiorano ESB: Peer-to-Peer Demystified

Fiorano Software has crafted a new paradigm in distributed applications built on industry standard messaging structures as shown below.

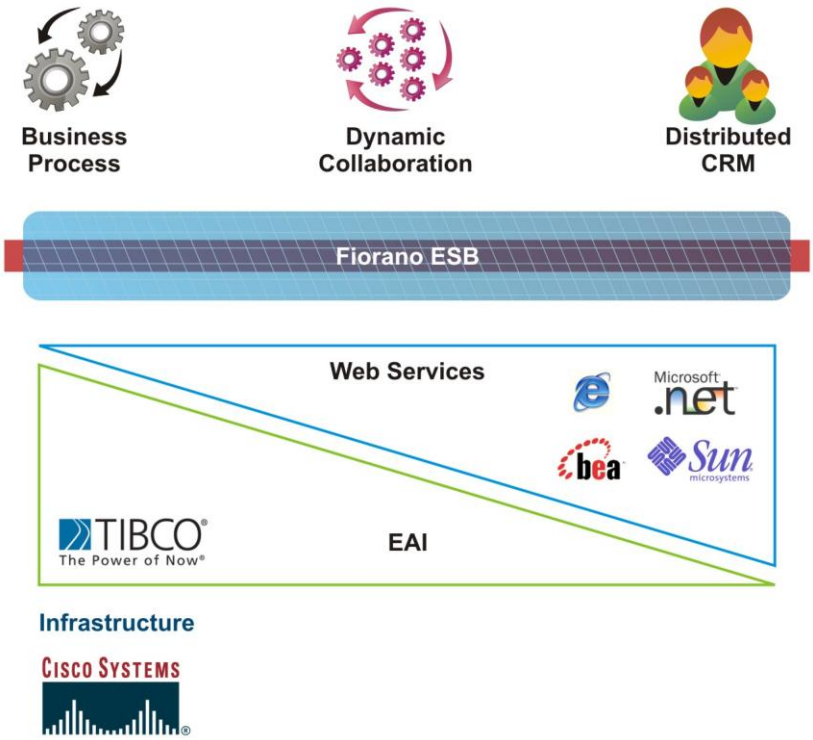

Figure 1: Unifying web services and back-end EAI solutions with Fiorano ESB

Fiorano ESB (Fiorano Enterprise Service Bus) is a Services Operating Platform that enables business-users to easily compose, modify and deploy new workflows in real-time. Fiorano ESB offers software-driven flexibility and enables the creation of seamless end-to-end component-based enterprise solutions that can be used to achieve immediate savings on applications spending in areas that include Enterprise Applications Integration (EAI), dynamic collaboration, distributed CRM among others, as shown below.

With a P2P infrastructure platform, EAI solutions become a lot more scalable because data can flow directly between applications as opposed to flowing through the centralized hub each time. There is no

centralized communications bottleneck. Modern P2P systems such as Fiorano ESB support tools that can be used to administer and control the complete network from a single location. This provides all of the administrative convenience of a hub-and-spoke architecture, with none of the performance and scalability problems. Importantly, P2P infrastructures utilize the already existing abundance of computational power resident at the network end-points - at no additional cost.

Enterprises with existing investments in traditional EAI systems can use Fiorano ESB to bridge their back-end EAI systems with front-end business-user desktops. Benefits include:

- Leveraging existing expertise and investments in back-end EAI solutions
- Deployment of light-weight P2P EAI solutions at the edge of the network, leveraging existing business-processes and allowing their real-time alteration and management
- Dramatic cost savings via an injection of affordable front-end EAI solutions, thus obviating the incremental spending on customization of the back-end systems
- Leverage the IT economies-of-skill, by letting business-users at the front-office create, alter and manage new business processes on-the-fly without IT intervention

Alternatively, Fiorano ESB can be used to architect new EAI solutions. Fiorano offers a palette of seventy-five services and is working with third-party vendors to add new service components to the platform. EAI consultants can now migrate from their current *'customize-everything'* approach to delivering a higher margin value - a library of reusable service components that align more closely with their customers' unique needs. Fiorano ESB thus enables EAI consultants to differentiate themselves and gain more strategic control of their accounts.

Enterprise Application Integration is just the beginning

Application developers have been used to creating service-level components at very low-level granularities of programming. The dot-com reality of *time-to-market at any cost* has resulted in diverse and customized code for enterprise business processes creating additional code to enable interoperability of these fragments results in greater expense and inefficiencies. In contrast, Fiorano encourages the creation of highly modular and reusable service components. Developers can work at a component-level granularity thereby reducing costs and creating efficiencies of scale.

The Fiorano Business Service Composer enables business-users to easily architect their workflows by integrating pre-existing services. New services can be added in real-time without causing a disruption of the workflow. A collective consisting of multiple peers can perform self-healing functions in the case of node failures - resulting in a very resilient and robust applications-fabric across the enterprise. As a result, Fiorano's partners are using Fiorano ESB across a broad spectrum of market segments, including EAI, Collaborative Computing, like Distributed CRM.

Schedule a demo of Fiorano ESB or for more details, send us an email to: info@fiorano.com

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.