



Peer-to-Peer Microservice Cloud Pipelines: Powering the Digital Economy

WHITEPAPER

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Executive Overview

The democratization of computing power began in the 90'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 'cloud 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 as the emergence of social, cloud, mobile computing, APIs and Big data fuel the rise and establishment of new and innovative integration patterns in the burgeoning digital economy.

Requirements for the next generation of Digital businesses are driven by a number of factors including:

- The exponential growth of data. IDC estimates that the volume of enterprise data is expected to grow at the rate of 50% per year through 2020, with 90% of the data being unstructured
- The acceptance of Service Orientation in the form of the new Microservices and [API Management](#) waves. Enterprise architects are increasingly recognizing the benefits and flexibility of Microservice based designs, both for infrastructure and end-user applications
- The growing need for 'citizen integrators' to perform integrations themselves with little external help. Tools need to evolve to enable these do-it-yourself integrations across hybrid environments
- A continued focus on performance in the presence of highly voluminous data distributed across enterprise, cloud and hybrid environments

Current integration platforms have evolved little over the past 20 years; they were designed primarily to handle structured data within the enterprise. Based on hub-and-spoke architectures with inherently limited scalability, these programming-heavy, often proprietary platforms are insufficient to address the evolving needs of emerging digital enterprises, which require the real-time processing of structured, semi-structured and unstructured data across enterprise, cloud and hybrid systems in real-time.

A new wave of applications and services are being deployed over hybrid enterprise/cloud networks to enable a 'services-on-tap' applications usage model. There is another transformation underway as Microservice-based, distributed applications become ubiquitous with the emergence of the digital business. In an age of doing more with less, modern integration and application development technologies need to evolve to meet the exploding growth in enterprise data, together with changing interaction patterns imposed by the nexus of forces.

Fiorano has an unwavering and clear vision to enable enterprises to seamlessly transition into real-time digital businesses. The [Fiorano Microservice Cloud platform](#) – a new paradigm in performance, scalability and simplicity – can be used in conjunction with existing enterprise platform infrastructures as easily as it can be used to create new peer-to-peer microservice-pipeline based solutions, enabling enterprises to achieve their business objectives through the interconnected use of digital technologies.

This paper discusses the benefits of a true Peer-to-Peer (P2P) platform architecture that addresses the demands of emerging digital enterprises with the ability to scale linearly across enterprise, [cloud and hybrid](#) environments using [Microservice-centric tools](#) enabling 'citizen integrators' to synthesize applications rapidly in response to changing business requirements.

The Peer-to-Peer (P2P) Mystique

While enterprises come to grips with the new set of challenges brought on by the emergence of social, **mobile**, cloud computing and the digital economy, the applications that form the core of an enterprise's business also need to be assimilated. Over the past twenty years, legacy application platform vendors have created non-trivial infrastructures within enterprises to enable integration, often via SOA (Services Oriented Architecture) initiatives. These 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
- The inability to easily integrate and assimilate semi-structured and unstructured data, which constitutes 90% of new data produced in the digital economy
- The inability to scale linearly across the cloud and hybrid environments due to communication and architectural bottlenecks in existing hub-and-spoke architectures
- Increased spending on hardware at the hubs because of data and control communication bottlenecks

A real-time digital enterprise requires its business leaders 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 in real-time. 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 work flows, and enable them with the ability to perform lightweight, self-service data and application integration – with no downtime penalties. Such “citizen integrators” require powerful visual tools to compose solutions on-demand using pre-tested Microservices that can be efficiently deployed across cloud or hybrid environments.

Legacy back-end integration and application platform systems, by the very nature of their underlying hub-and-spoke architecture, are not ideally architected to meet the scalability and performance needs of the emerging real-time digital businesses. **Real-time** enterprises are now demanding peer-to-peer oriented application infrastructure solutions that map naturally to and leverages cloud and hybrid environments, to get the highest returns on their investments.

A new breed of platform 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, 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 Microservice-centric perspectives in programming.

Fiorano: Peer-to-Peer Microservices Demystified

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

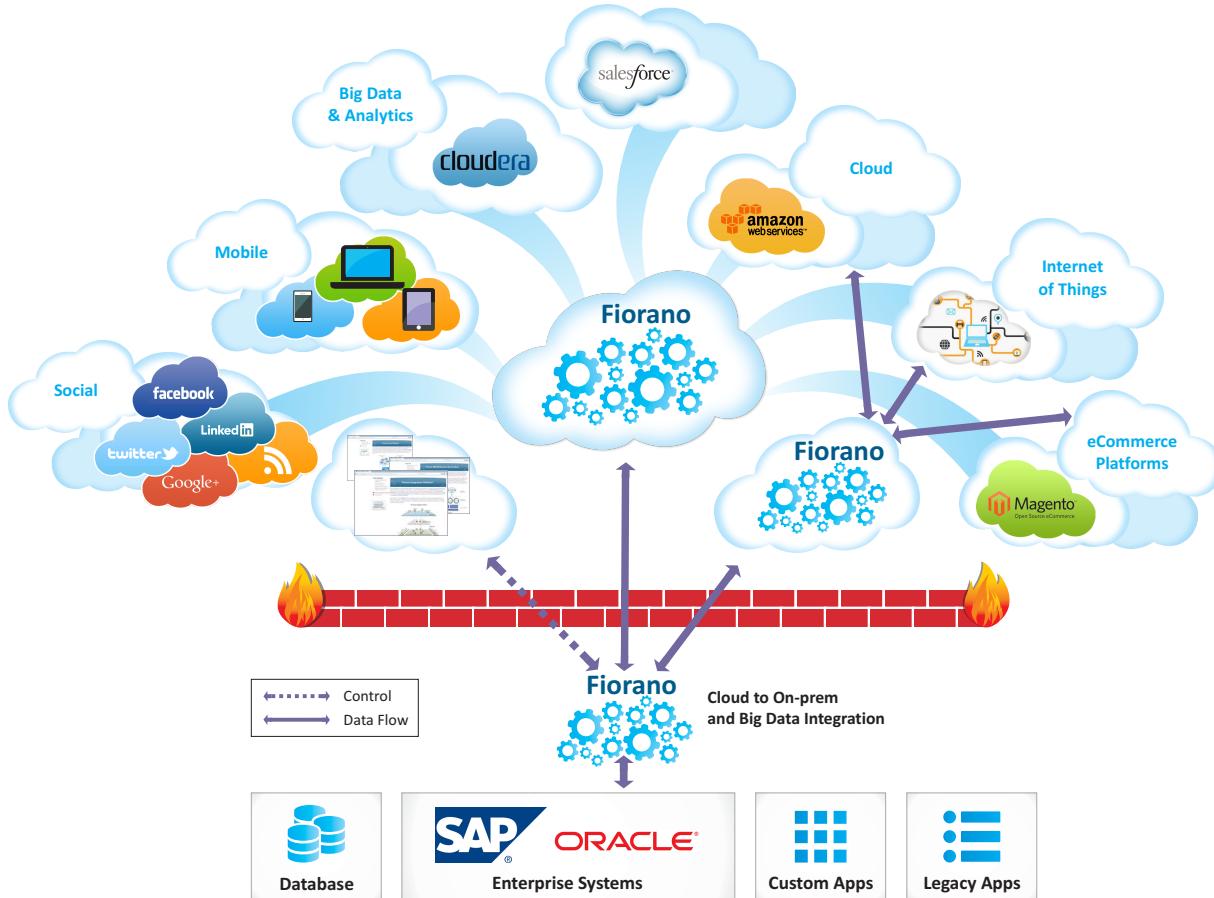


Figure 1: Unifying Microservices and Social/Mobile/Cloud solutions with Fiorano

The Fiorano Microservices Platform enables business-users to easily compose, modify and deploy new “Microservice flows” in **real-time**. Fiorano offers software-driven flexibility and enables the creation of agile end-to-end Microservice-based enterprise solutions that can be used to achieve immediate savings on applications spending in areas that include integration, social, mobile, API and cloud applications among others, as shown above.

With an underlying **Peer-to-Peer** (P2P) infrastructure platform, Microservice-based solutions become significantly more scalable because data can flow in a pipeline directly between Microservices distributed across cloud, on-premise or hybrid environments as opposed to flowing through a centralized hub each time. Centralized communication bottlenecks are a thing of the past.

Modern P2P systems such as the **Fiorano platform** support tools that can be used to administer and control the complete Microservices 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. Modern P2P infrastructures are designed to utilize the already existing abundance of computational power resident within the enterprise network, together with on-demand cloud and hybrid system resources.

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

- Leveraging existing expertise investments in back-end application platform solutions
- Deployment of light-weight P2P Microservice-centric integration 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 Microservice-based solutions, thus obviating the incremental spending on customization of the back-end systems
- Leverage the IT economies-of-skill, by letting “citizen integrators” at the front-office create, alter and manage new business processes on-the-fly without IT intervention
- Easy management and assimilation of semi-structured and unstructured data with support for REST, JSON and other modern protocols

Alternatively, Fiorano can be used to architect new Microservice-based application solutions that can be instantly deployed over a P2P infrastructure in the cloud, on-premise or over a hybrid architecture. Fiorano offers a palette of over three hundred Microservices and is working with third-party vendors to add new Microservices to the platform. Enterprise integration consultants can now migrate from their current 'customize-everything' approach to delivering a higher margin value – a library of reusable Microservices that align more closely with their customers' unique needs – and achieve operational excellence. Fiorano thus enables Integration consulting teams to differentiate themselves and gain more strategic control of their accounts.

Integration is just the beginning

Application developers have hitherto been used to creating Services at very low-level granularities of programming. The new 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 coarse-grained, highly modular and reusable Microservices. Developers can work at a “process-level” granularity thereby reducing costs and creating efficiencies of scale.

Fiorano Tools give business users the elegance of visual drag-and-drop simplicity to create, monitor and alter their business processes using Microservices. New services can be added in real-time to existing running processes without disruption. 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 customers are using the platform across a broad spectrum of market segments, including Integration, Social, Mobile, Cloud computing and [API Management](#) among others.

ABOUT FIORANO SOFTWARE

Founded in 1995, Silicon Valley based Fiorano is a USA (California) Corporation, a trusted provider of Digital Business Backplane and enterprise integration middleware, high performance messaging and peer-to-peer distributed systems. Fiorano powers real time, digital enterprises with bimodal integration and API Management strategy that leverages the best of systematic (centralized, high-control) and adaptive (federated, high-speed) approaches to deliver solutions across cloud, on-premise and hybrid environments.

Global leaders including AT&T Wireless, Boeing, British Telecom, Federal Bank, L'Oréal, McKesson, NASA, POSCO, Rabobank, Royal Bank of Scotland, Schlumberger, US Coast Guard and Vodafone have deployed Fiorano to drive innovation through open, standards-based, event-driven real-time solutions yielding unprecedented productivity.

To find out more about how Fiorano can help you meet your enterprise integration objectives, visit www.fiorano.com or e-mail sales@fiorano.com

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