



Fiorano
Peer-to-Peer Dataflow Pipelines™

US COAST GUARD LAUNCHES SOA INITIATIVE WITH FIORANO SOA PLATFORM

Peer-to-Peer ESB Pioneer Helps Track 6,000 Ships Spanning US Coastal Waters

"For the United States Coast Guard, adopting enterprise-wide SOA as part of our Enterprise Architecture Framework was a necessity to deliver mission-critical, real-time information from our vast diversity of application and data sources.

Following a rigorous 18-month evaluation involving more than a dozen alternatives, Fiorano's SOA Platform was selected to implement the Coast Guard's SOA solutions"

**Steve Munson,
Chief of Enterprise Engineering Services,
United States Coast Guard Operations Systems
Center**

CUSTOMER PROFILE

The United States Coast Guard (USCG) is a military branch of the United States that has a broad and important role in homeland security, law enforcement, search and rescue, marine environmental pollution response, and the maintenance of river, intra coastal and offshore aids to navigation (ATON). It also lays claim to being the United States' oldest continuous seagoing service.

The United States Coast Guard has about 40,150 men and women on active duty. The USCG Operations Center, located in Martinsburg, WV, serves as the premier software development center for the Coast Guard and the Department of Homeland Security.

BUSINESS PROBLEM

The Klinger-Cohen Act of 1996 mandates that federal agencies should operate exactly as efficient and profitable businesses would operate by developing a proficient [enterprise architecture](#). Beyond the federal mandate, an economical infrastructure simply makes good business sense, even for a federal body.

The United States Coast Guard reached architectural maturity in 2005. Software developers at the USCG Operations Center, one of the Coast Guard's centers of excellence where it performs software development and systems hosting for the entire Coast Guard and other entities within homeland security, decided to implement a business-driven enterprise architecture to more fully connect information technology systems and business infrastructure.

As acting Chief Technology Officer of the Project under the SETS-II contract, QSS Group's James Jennis was charged with the primary responsibility of implementing enterprise architecture. "The USCG needed an enterprise architecture solution that was document-based and [event-driven](#). We would have to develop a technical implementation of the architecture that custom-fit to Coast Guard doctrine."

Additionally, the USCG would need to find efficient and reliable [enterprise service bus technology](#) for its technical implementation of the architecture.

With an organization as large and prestigious as the USCG, Mr. Jennis and his team would have to evaluate a wide variety of solutions on the market. But was there a solution that was powerful enough to complement the USCG's rigid standards?

SELECTION PROCESS

Mr. Jennis and his team performed a cut-and-dry evaluation, surveying the market using the Coast Guard's existing architecture and needs as a measuring stick. Eventually, the USCG whittled its search down to 13 different powerful products – one of which was Fiorano's SOA solution. USCG performed an initial round of evaluation of vendor glossies, demonstrations and interviews, out of which seven vendors emerged.

Mr. Jennis comments, "At this point in the evaluation process, we put each vendor through a very rigorous proof-of-concept process. We asked each vendor to come in and implement a Coast Guard business solution and graded them based on the success of the solution. Afterwards, we took time to measure the solution against certain performance metrics and assess each vendor for various business factors – how stable they are, how good their support is, etc."

Based on the vendors' scores in 12 different categories, [Fiorano SOA](#) was selected at the first phase. The evaluation, however was not over; the next phase would evaluate the top contenders based on long term factors like scalability and reliability. The top contenders would have to take part in a one-year long POC, beginning in the fall of 2007.

"Our evaluation criteria were many," mentions Mr. Jennis. "For one, the solution we would choose would have to comply with Coast Guard architecture. Some of the evaluation categories were: overall cost, installation, maintenance, tool sets, debugging, configuration management, administering applications, feature support, and performance metrics on the proof-of-concept."

Over the year evaluation, Fiorano SOA's reliable [backbone messaging](#), high scalability and ability to handle thousands of [messages per second](#) were all factors that helped Fiorano stand out against other solutions.

PROOF OF CONCEPT

Business Problem

- The agency's warehouse management was facing a big challenge in extending its services for its users, owing to complexity of integrating its existing systems.
- Managing Inventory across different locations was getting increasingly cumbersome.
- Increasing Cost of maintenance owing to:
 - Significant manual work relating to data manipulation and processing
 - Lack of transactional visibility
 - Extended 'time-to-go-live' deterring much needed changes in existing business processes

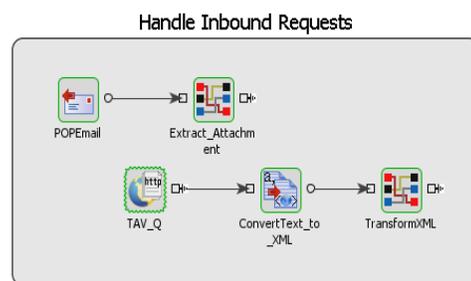
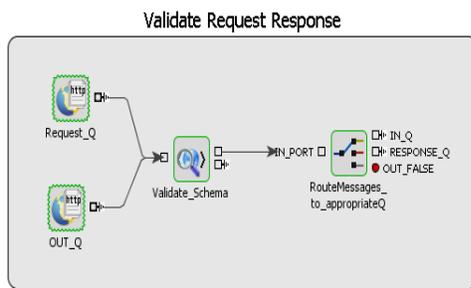
Solution

The process of inventory management for US Coast Guard is -

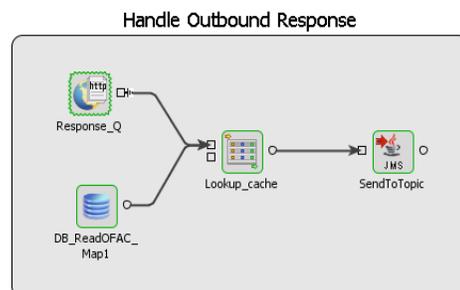
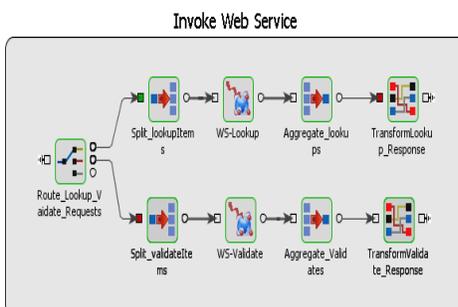
- The inventory requests arrive as flat file email attachments or as a request from a web application
- These inbound or outbound requests were transformed to XML and sent for validation
- Once transformed and validated, the XMLs were routed to JMS queues.
- The transformed inbound messages invoked appropriate web services.
- The response messages were to be published on to appropriate destinations based on an Oracle database lookup.

Fiorano implemented the solution using out-of-the-box services shipped with the platform.

Snapshots of the Fiorano Solution for the POC are illustrated below:



The inbound requests in the form of flat file were extracted from the mail server and were published on to a pre-defined destination. These messages were picked by Fiorano adapter to convert them to XML and publish them on another JMS destination for further processing. The inbound XMLs are picked from the relevant [JMS Queues](#) and validated for conformance by the [XML Verification component](#). The CBR component routes the messages to appropriate data channels depending on the nature of the message (Request / Response); the same flow is reused to handle both requests as well as responses. The validated requests are routed to appropriate dataflows. The response from the Web Service is dynamically routed to an appropriate JMS destination, depending on a lookup in real-time.



SOLUTIONS

Initial SOA Initiative - Long Range Identification and Tracking (LRIT)

One of the initial SOA projects to be identified by the USCG was the implementation of a [Long Range Identification Tracking \(LRIT\)](#) System for ships.

Long Range Identification and Tracking was proposed by the United States Coast Guard (USCG) at the [International Maritime Organization \(IMO\)](#) in London during the aftermath of the September 11, 2001 attacks to track the approximately 50,000 large ships around the world. The LRIT regulation and computer system will allow the USCG to receive information about all vessels within 1,000 nautical miles (1,900 km) of US territory.

In January 2009, the United States of America became one of the first SOLAS (Safety of Life at Sea) Contracting Governments to implement a National Data Centre and comply with the LRIT regulation.

The US Coast Guard LRIT System, now a SOA-aware service, tracks every vessel in US coastal waters that weighs more than 300 tons through a [peer-to-peer, real-time](#) distributed network of over 6,000 ship transponders, powered by the [Fiorano Enterprise Service Bus \(ESB\)](#). These ships must automatically report their position to their Flag Administration every six hours, with ship transponders emitting critical signals every 3 seconds.

"As this initiative scales, it could become one of the largest ESB deployments in the world", said Atul Saini, CEO, Fiorano.

Integration of LRIT information with that from ship transponders enables the Coast Guard to correlate Long Range Identification and Tracking (LRIT) data with data from other sources, detect anomalies, and heighten overall Maritime Domain Awareness. The United States implementation of this regulation is consistent with the Coast Guard's strategic goals of maritime security and maritime safety, and the Department's strategic goals of awareness, prevention, protection, and response.

BENEFITS

"For the United States Coast Guard, adopting enterprise-wide SOA as part of our Enterprise Architecture Framework was a necessity to deliver mission-critical, real-time information from our vast diversity of application and data sources. Following a rigorous 18-month evaluation involving more than a dozen alternatives, Fiorano's SOA Platform was selected to implement the Coast Guard's SOA solutions" says Mr. Steve Munson, Chief of Enterprise Engineering Services, United States Coast Guard Operations Systems Center.

Fiorano meets key requirements as articulated recently at a Defense Information Systems Agency (DISA) conference: *"Any new technologies must be compatible, incremental and usable enterprise-wide to avoid disruption of operations in particular"* the panelists at the conference said. Fiorano's standards based ESB technology provides precisely such a platform that Agencies can then build on by simply composing new event-driven services with the flexibility of easy change.

Alignment with DHS and Federal Enterprise Architecture (FEA) Framework

The Office of the Inspector General (OIG) of the [Department of Homeland Security](#) (DHS) has recently recognized, in their Audit report [OIG-09-93](#) (July 2009), the significant progress the Coast Guard has made in developing its enterprise architecture framework in alignment with both the DHS architecture and the United States Federal Enterprise Architecture (FEA) framework.

Fiorano's distributed architecture, built on the Fiorano Enterprise Service Bus maps well onto the FEA providing Federal Departments a solid, systematic way to build a system that integrates its various Agencies.

ABOUT FIORANO SOFTWARE

Founded in 1995, Silicon Valley based Fiorano is a California Corporation with proven leadership in enterprise middleware and [peer-to-peer](#) distributed systems. Fiorano's innovative [event-driven](#), dataflow [SOA platform](#) integrates applications and complex technologies into an enterprise nervous system, increases business process performance, yields higher message throughput and enhances availability through agent-based visual composition that bridges the capability gap between business models and their implementation – the model is the application, ready to run.

Global leaders including ABN AMRO, Boeing, British Telecom, Capgemini Telecom, Chicago Mercantile Exchange Group, McKesson, NASA, POSCO Steel, Qwest Communications, Rabobank, Schlumberger, Lockheed Martin, United States Coast Guard and Vodafone have deployed Fiorano to drive innovation through open, standards-based, dataflow [SOA](#) applications built in just days, yielding unprecedented productivity.

[Fiorano Enterprise Service Bus](#) (ESB) and [Fiorano Message Queue](#) (MQ) deliver the industry fastest, lowest latency, highest throughput [real-time messaging](#) (asynchronous and synchronous) to power [high performance](#), highly available, and collaborative workflow applications whose application services are distributed throughout the IT landscape. Fiorano's distributed, peer-to-peer agents' abstract complexity of developing and deploying services to unlock value in a customer's enterprise architecture framework.

To find out more about how Fiorano can help you meet your enterprise integration objectives, visit www.fiorano.com or [Email us, we will contact you!](#)