BMK Consultants White Paper

6 March 2014

Architecture and Development of the

DISA Med COI Service

Presented to:

<u>*Ms. Susan Eaton*</u>

Presented by:

BMK Consultants, Ray Montford & Erik Scheirer

Written by:

Erik Scheirer

BMK Senior Software/Systems Architect and Developer

Erik.Scheirer@bmkconsultants.com

Technical Aspects
Regarding the
Architecture and Development of the
DISA Med COI Service

Abstract

The design, architecture, and implementation of an enterprise-grade integration and authentication platform is a highly complex undertaking, from provisioning and authentication to ongoing maintenance and systems and software integration; often, such 'integration and authentication' systems are regarded as simple, and easy to cobble together using off-the-shelf components. But they tend to be nothing simple or easy because there are many moving parts, all of which must be kept robust, maintainable, and secure; many systemic components can be disparate and as such require sophisticated handling in order to be able to interleave the components correctly. There are, however, novel methodologies and techniques available in the industry and in our experience that make such systems manageable and within reach of a small team of technical staff.

Introduction

Many projects that involve the characteristics described below take a technical and non-technical approach that adversely affects security and accuracy, cost, productivity, and maintainability:

- Secure remote connections, such as allowed by VPNs ("Virtual Private Networks")

- User authentication (Authentication System)

- Sensitive information that must be protected by access control (usually in conjunction with an Authentication System)

- Data migration, where data is copied/migrated from a SOR ("System of Record", the original storage system of that data), possibly on a periodic or conditional basis

- Data "shadowing" (where data must be copied out of a source system) and integration (where data may be aggregated to form new data and is stored in other systems that are not the original SOR)

- Data size, such as how to correctly handle and leverage "Big Data" where needed

- Business Logic / Rules, such as when to fire Events in other systems or to propagate data reduction or enhancement

- Event handling between data sources and state changes in that data

- Addition of new Users, Data Sources, Connections, and the Business Logic etc. that these will require

Often, the system and software architecture will use a 'one big hammer' approach that tries to leverage one single tool or platform known by the architects, in order to keep the number of different pieces smaller; but this is only true from the "50,000 foot level" where boxes with arrows connecting them are drawn in diagrams or on whiteboards. Even when a more flexible approach is taken to avoid the 'one big hammer' pitfalls; what invariably happens at the detailed level is much work is needed to massage data and communication of said data in its various forms. These systems tend to be very brittle from the start, and only get worse over time; they require laboring many hours to keep up with the incoming flow of changes, new entities, and new rules and requirements. Because of this brittle approach the projects tend to suffer from the start, with time overruns, staffing difficulties, loss of functionality with regards to contributing systems, and staff bloating - all of which affect cost in funding and trust with participating groups and organizations and the customer.

While no single or combined approach can solve all the technical and managerial problems which often plague projects; there is wisdom, experience, and cutting-edge practices to be leveraged to affect minimized project cost and team size while building trust with the participating groups and users by continually delivering the much customer desired on-time, relevant, and accurate functionality and capabilities. The careful attention paid by BMK Consultants & Team of SME's to the exact technical architecture and the management and engineering processes the architecture affords can achieve this effect. It is achieved by a specific combination of software tools, platforms, people, and processes that in total yields these desired characteristics. We have direct experience providing this expertise, and our staff has many years of successful implementation experience with Large-Scale and Big Data Systems.

Conclusions and Related Work

Our BMK staff of SMEs has direct experience in all the areas required to successfully design, implement, and maintain systems such as the one described within our BMK Consultants White Paper Dated: 6 March 2014 - Titled: *"Technical Aspects Regarding the Architecture and Development of the DISA Med COI Service"*. In addition, our availability of a vast pool of resources to correctly staff such an effort as the one described with the essential personnel; specifically, a small team of highly experienced senior level engineers and architect(s) is the best way to ensure success - a small group such as ours would be able to come together quickly, have meaningful discussions and reach a consensus allowing the project to keep moving forward with minimal delay.

BMK Experience:

- building full Validation Authorities for use by Industrial-Strength Authentication systems (including full HSPD-12 support and full two- and three-factor authentication - essential for providing Robust and Secure Authentication)

- building large-scale Enterprise Systems from the ground up, or enhancing existing ones

- building Enterprise Integration from existing or new Enterprise Systems or any mix of them

- strong Software and Systems Architecture and Development

- technical Project Management using Agile methodologies such as SCRUM - which keeps a high-touch interaction going with all the interested parties of a project, in order to build trust through accurate delivery and sizing/scope of components and features

- building Big Data systems from the ground up, or scaling and enhancing from an existing system

- building Processes, Analytics, Data Migration and Processing, Data Shadowing, and Business Logic and Rules