



A SMARTER APPROACH TO APPLICATION MODERNIZATION

Leveraging commercially supported open source middleware makes sense for government.

THE PRIMARY MISSION OF GOVERNMENT AGENCIES IS TO EFFICIENTLY AND EFFECTIVELY SERVE THEIR CITIZENS

— and they rely on data systems to do so. These agencies rely on real-time data to provide food and income assistance, medical care and safe housing. However, these data systems are often outdated, siloed and inaccessible. Some state and local governments are turning to commercially supported open source middleware solutions to alleviate these barriers.

For example, while working on a data consolidation project for the U.S. Department of Defense (DoD), SpinSys — a Red Hat systems integrator — encountered a scenario that is familiar to many government agencies: Legacy applications, decentralized information and disparate IT systems were preventing timely access to information and the seamless integration and sharing of data and applications across the enterprise. Patient records and hospital data resided in more than 100 silos spread across the

globe and none of these systems communicated with each other. The lack of data and integration left health care providers and military personnel in the dark.

“To make better decisions and have more control over daily operations, the DoD needed to pull data in as near-real time as possible and then aggregate that data into one centralized enterprise location where they would have a 360-degree view of all their records,” says Wael Ali, president and CEO of SpinSys.¹

THE CHALLENGE: GOVERNMENT RESTRAINTS UPHOLD DATA SILOS

Many federal and state government agencies face the same types of challenges as the DoD. Because government data systems are managed by different departments and

contractors, they are often decentralized and lack a well-designed integration strategy. On top of this, the agencies served by these systems can be constrained by government policies, security guidelines and procedures. And cost is always a sticking point — government agencies spend almost half of their annual IT budgets supporting legacy systems.² However, updating these systems as policies and business requirements change can also prove to be cost prohibitive.

Despite these challenges, government IT professionals are finding that commercially supported open source middleware solutions can help deliver new services quickly and cost effectively, while also providing a strategic path for transitioning workloads to an on-premises or external cloud. By using open source middleware and open standards, organizations can modernize legacy applications for use in mobile, web-based and cloud applications, as well as set up dynamic, content-rich websites and user portals with access to near real-time data.

In the case of the DoD, SpinSys used an open source middleware integration solution from Red Hat to act as a centralized enterprise repository for health records that were collected via software designed by SpinSys. On a daily basis, the solution collects billions of patient records — more than 30 terabytes of data — in near-real time and saves it in the enterprise repository where it is available anywhere, anytime via a web browser or other channels. The system is updated every 30 seconds, allowing health care providers to immediately access patient information.

THE OPPORTUNITY: TAKING APPLICATIONS INTO THE FUTURE

At the most basic level, application modernization is the refinement, rewriting, repurposing or consolidation of legacy applications to meet current business needs. Typically, organizations use middleware to act as a bridge between applications, databases, operating systems, cloud services and other important components of the enterprise application landscape. Using commercially supported open source middleware, organizations can easily and cost effectively address key drivers of application modernization, including the need for real-time access to big data; the ever-increasing demand for mobile, web-enabled and cloud-based applications; and the Internet of Things.

For example, open source middleware allowed the DoD to launch an online portal for patient health records. In the past, military personnel, who are frequently stationed at multiple bases throughout their career, had to contact each base to collect their medical records upon completion

WHY USE COMMERCIALY SUPPORTED MIDDLEWARE?

OPEN SOURCE TECHNOLOGY: Draws on open source technology to provide additional functionality and support integration into the existing environment

STABILITY: Tends to be more stable than upstream products, where open source code is changed frequently

QUALITY ASSURANCE: “Our engineering team runs the code through a 90- to 120-day process. There’s security hardening, regression testing ... there are all sorts of steps in the process that our team internally goes through before we go to market with a specific version of a product and say we will commercially support this product,” says Mike Bourgeois, middleware solutions specialist at Red Hat.³

of their military service. Now they can download their health history online because the data is available in a secure and centralized location. Easy access to personal records alleviates administrative burden and helps military personnel more easily enroll their children in new schools when they move — immunization records, medications, allergies and other important details are readily available.

“With traditional middleware, fresh data is available on an hourly, daily, weekly or monthly basis. This type of lag between data generation and data consumption is unacceptable in today’s fast-paced world.”

Wael Ali, President and CEO, SpinSys

Commercially supported open source middleware provides opportunities to modernize state and local governments as well — consider the data that is collected, stored and accessed by government agencies. Traffic officers can use mobile devices to record witness statements, photographs and other evidence and then send the information to a backend system for storage or analysis. Police officers with body cameras can document interactions and rapidly forward information to central command officers who can analyze and respond to unfolding situations. Child protection workers can access historical data or report suspicious situations in a centralized location to help monitor and evaluate a child’s safety. State and city attorneys can share and annotate discovery filings and other case information across enterprise systems. Citizens can more easily access public records and contribute to data collection efforts related to public health, pest control, road repairs, census-taking and more.



Besides meeting citizen demand and internal requirements for innovative services, government organizations stand to accrue other important benefits from application modernization. With the right solution, agencies can:

- ▶ Create new business value from existing data and applications
- ▶ Extend the life of long-term investments in mainframes
- ▶ Ensure the availability and sustainability of mission-critical capabilities
- ▶ Turn big data into actionable data
- ▶ Create a path for transitioning to cloud-based solutions
- ▶ Reduce annual operating costs

OPEN SOURCE MIDDLEWARE: PORTABLE, SECURE, INNOVATIVE, INEXPENSIVE

Commercially supported open source middleware solutions are critical for government agencies that need to modernize their middleware, IT infrastructure and applications to work dynamically across the entire IT enterprise — including the cloud. Open source middleware uses non-proprietary source code, which significantly lowers costs and complexity while allowing more freedom to innovate and provide government services via a variety of computers and mobile devices.

Using open source middleware solutions from Red Hat, SpinSys' government customers can integrate with a wide range of data sources, including databases, file systems,

devices, kiosks, third-party applications, legacy systems and API-based solutions. In addition, organizations can collect data in near-real time.

"With traditional middleware, fresh data is available on an hourly, daily, weekly or monthly basis. This type of lag between data generation and data consumption is unacceptable in today's fast-paced world," says Ali. "With Red Hat's middleware solution, our typical latency is 10 milliseconds to a maximum of 5 minutes. This really shows the power of the Red Hat solution and how it makes things possible for us."



FLEXIBLE PATH TO MODERNIZATION AND THE CLOUD

According to Mike Bourgeois, middleware solutions specialist at Red Hat, moving to the cloud is a key driver for many agencies turning to Red Hat's open source middleware solutions. "I would say on average the highest priority issue at this point is government's inability to move applications to cloud," says Bourgeois. "In every state there is a statewide CIO and the first of their top three priorities is either going to be security, cloud enablement and/or application modernization."

Red Hat's open source middleware product portfolio uses a loosely coupled, modular development approach to allow government organizations to transition away from mainframe investments, modernize legacy applications and cloud-enable applications while meeting agency security requirements. Unlike proprietary solutions that can lead to vendor lock-in,

open source middleware can be deployed to a variety of on-premises or external cloud platforms without changing the application source code. Organizations may choose to cloud-enable workloads and flexibly move those assets to an external cloud provider when on-premises data center infrastructure is fully depreciated. This gives government organizations a low risk, orderly path to modern, flexible and scalable applications that satisfy their highest priorities.

Organizations can provide more government services and reduce capital expenses by utilizing a subscription-based open source support model. Proprietary middleware solutions tend to have rigid licensing terms that prohibit customization, the addition of new functionalities or migration to the cloud. Because Red Hat's subscription-based support model does not restrict where Red Hat middleware can run, organizations can use middleware assets on premises, in addition to external cloud providers — without negotiating new contracts or paying additional fees.

BENEFITS OF RED HAT'S OPEN SOURCE MIDDLEWARE SOLUTIONS

COST-EFFECTIVE PRICING MODEL: Red Hat offers subscription-based pricing, which tends to be less expensive than the licensing model other vendors offer.

ACCESS TO SOURCE CODE: Access to source codes allows agencies to conduct full security scans and choose and configure components that fit their unique needs.

NO VENDOR LOCK-IN: When agencies choose a proprietary solution, they can become stuck with a specific vendor and its solution. Open source is not proprietary, which means anybody can integrate, share or collaborate with it.

EXTENSIBILITY AND FLEXIBILITY: Red Hat offers a modular architecture that enables agencies to extend the core product to meet individual organization requirements and challenges.

CONTINUOUS IMPROVEMENT AND INNOVATION: Open source solutions have proven to be on the leading edge of innovation. Red Hat leverages a global community of contributors, which provides tested, proven solutions.



ADVANTAGES OF OPEN SOURCE VS. PROPRIETARY MIDDLEWARE

Government organizations grappling with big data, the Internet of Things, the transition to web-, mobile- and cloud-enabled applications, and other application modernization projects are discovering that commercially supported open source middleware solutions present many advantages when compared to proprietary middleware.

In handling government big data projects, SpinSys found that Red Hat's open source solutions allow for the most successful results.

"We look for a middleware platform that is proven, reliable, secure and feature rich. It must be scalable and able to grow with increasing data requirements and ever-changing customer needs," says Ali. "In addition, it must be flexible and portable so that it can be developed both on-premises and in cloud environments. Above all, it must be cost effective so that we can be competitive in the marketplace."



BEST PRACTICES FOR MODERNIZATION

The following best practices can help government organizations successfully navigate the path to modernization.

- ▶ **Understand the business benefits of modernization.** Do not replace a system for the sake of upgrading to a newer technology.
- ▶ **Use an incremental approach.** Evaluate current legacy applications and technology components, and choose an agile approach to modernization. "Take a methodical approach to the people, processes and applications," says Bourgeois. "Migration to a cloud provider will touch all of those — there may be some process reorganization." Work with functional teams within the organization to monitor prototypes, provide feedback and confirm the approach is working.
- ▶ **Leverage existing systems where possible** to reduce costs, complexity and time to delivery.
- ▶ **Understand data and system dependencies prior to migration.** A deep-dive discovery provides the foundation for a meaningful, solid plan to move forward.
- ▶ **Choose an open source vendor that offers expertise and support.** Modernizing applications and moving workloads to the cloud involves numerous moving parts and complex decisions. An industry leader in open source solutions can provide hands-on experience and methodical processes to help evaluate each application, where it should run and what it should be connected to, especially when security and regulatory requirements are at stake.

1. All quotes and information from a phone interview with Wael Ali conducted on May 4, 2016.
2. <https://fcw.com/articles/2016/01/11/new-study-on-modernizing-it-applications.aspx>
3. All quotes and information from a phone interview with Mike Bourgeois conducted on April 11, 2016.



The US government demands performance, transparency, and value—exactly what Red Hat and open source offer. Red Hat is the standard choice for Linux in governments worldwide. Our cloud, virtualization, storage, platform and service-oriented solutions bring real freedom and collaboration to federal, state, local, and academic programs. And Red Hat's worldwide support, training and consulting services bring the power of open source to your agency. We are a part of a larger community working together to drive innovation. Learn more at www.redhat.com/government