

TRANSFORMING HEALTHCARE WITH AN OPEN I.T. INFRASTRUCTURE



“Half of healthcare organizations will experience up to five cyberattacks in one year. Of those attacks, one out of three will be successful.”

“IDC REVEALS HEALTH INSIGHTS
PREDICTIONS FOR 2015,”
IDC, NOVEMBER 2014



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EXECUTIVE SUMMARY

“Agile” and “innovative” aren’t usually the first descriptors that come to mind when we think about the U.S. healthcare industry. Today, that’s changing at a mind-blowing pace. New technology is allowing healthcare companies to become leaner, more efficient, more cost-effective, and more patient-centric than ever before.

At the same time, change is never easy. The healthcare sector has experienced an unprecedented level of mandatory transformation—extensive regulatory changes, a shift from fee-for-service to value-based care, and competitive challenges. Every participant in the healthcare value chain has felt the pain, even while recognizing the opportunities transformation can provide.

Payers, providers, and life sciences companies face myriad challenges as they remake their organizations to

- Comply with evolving regulations.
- Find new ways to reduce costs.
- Manage population health.
- Remain competitive.
- Adapt to a new value-based care model.
- Achieve interoperability with the healthcare community.

At the center of the healthcare revolution are senior IT decision-makers tasked with enabling startling and swift innovation. These leaders must help their organizations navigate upheavals in business models, implement cost-cutting methodologies, and meet regulatory mandates.

To meet today’s industry challenges and transform healthcare as we know it, healthcare organizations need a technology infrastructure that can

- Improve efficiency, reduce complexity, and lower the total cost of ownership (TCO) to help fund innovation.
- Support the rapid development and deployment of innovative new applications including cloud and mobile apps.
- Deliver the security and interoperability needed to connect participants in the healthcare continuum and the Internet of Things.
- Scale and flex to support growth, consolidation, mergers, exponential volumes of data, and new business models.

This paper addresses the issues that are most top of mind for today’s senior IT executives in healthcare organizations. It shows how an open, secure, interoperable IT infrastructure can help IT stimulate innovation throughout the organization, while creating greater IT efficiency, stability, scalability, and security than ever before.

FORCES OF CHANGE IN HEALTHCARE

Innovative new technology is creating fascinating and highly beneficial opportunities to improve patient outcomes—think wearable technology that monitors the health of patients with chronic diseases, or even the more futuristic possibility of 3-D-printed organs and bones. However, before healthcare organizations can truly embrace these new technologies, they must be prepared to meet the daunting business challenges of the new healthcare industry.

One of several forces applying intense pressure on the healthcare industry is the Affordable Care Act (ACA), not to be underestimated in the far-reaching changes it seeks to accomplish. From a focus on patient outcomes to required technology usage, the ripples from its passage are still being felt by healthcare organizations.

At the same time, other drivers, such as the economy and the rise of greater consumer power, have created a more competitive landscape than ever before. Healthcare organizations are, for the first time in many cases, being forced to compete on costs as well as service, moving the mandate for operational efficiency to the forefront.

There are three main areas that healthcare companies must successfully and quickly address if they want to survive and thrive within this new environment:

- **Focus on patient outcomes and population health.** The overarching premise of the ACA and other mandates is to improve quality of care and patient outcomes while increasing efficiency and reducing costs. For providers, this means improving care management and coordination, as well as collaborating more effectively with other providers by connecting digitally to the healthcare community. Meaningful use mandates require organizations to engage patients, empower them with personalized information, and encourage them to take ownership of their health.
- **Do more with less.** As a result of the ACA, healthcare organizations must find ways to reduce costs without negatively impacting patient care. Across the healthcare spectrum, organizations must improve operational efficiency to remain competitive while funding innovative ways to impact patient wellness and outcomes.
- **Adopt new business models.** Part of the focus of healthcare reform is to encourage companies to move away from the traditional fee-for-service/volume model to a value-based care model that rewards providers for improved patient outcomes. As a result, many stakeholders of the healthcare continuum are entering into new business models to deliver value-based care goals to improve patient care while reducing costs.

Technology is a crucial component of the solution for addressing these challenges and transforming healthcare for the good of the patient as well as the business. Nearly every department will be impacted by the changes happening within and between healthcare organizations, and that means nearly everyone involved in healthcare is looking to the IT department to make it all work—quickly, effectively, and efficiently.

I.T. INFRASTRUCTURE CRITICAL TO PAY- FOR-PERFORMANCE REIMBURSEMENT

According to a survey conducted by ORC International and commissioned by McKesson, the transition from a volume-based model of reimbursement to models based on measures of value will create significant technology challenges to fully implement:

- Payers expect fee-for-service reimbursement to decrease from 56% to 32% by 2020.
- Payers and hospitals say pay-for-performance is the most challenging to implement, with 15% of payers and 22% of hospitals characterizing pay-for-performance as “very difficult” or “extremely difficult.”
- Respondents said the need for better business IT infrastructure and systems is one of the top three reasons why pay-for-performance is difficult to implement.

“THE 2014 STATE OF
VALUE-BASED REIMBURSEMENT,”
MCKESSON, JUNE 2014

GROUND ZERO FOR TRANSFORMATION

Let’s look at how healthcare business challenges translate into mandates for the IT organization.

DEPLOY APPLICATIONS THAT SUPPORT NEW BUSINESS MODELS

Payers need to transform their business applications to support new reimbursement models. Providers need new applications and capabilities to support value-based business models that track and measure patient outcomes and help manage population health. Developers need an agile infrastructure that lets them deliver these new applications and capabilities on an accelerated schedule. The IT infrastructure must be flexible and scalable to support rolling out these new systems and changes quickly, while ensuring the performance, reliability, and security needed in the healthcare environment.

DELIVER INNOVATION WITHOUT A SIGNIFICANTLY LARGER BUDGET

While technology innovation is imperative for transforming the healthcare business model and improving patient outcomes, organizations don’t have unlimited funds and resources for new projects. To free up budget for new applications and services, senior IT decision-makers are forced to reduce both capital expenditures (CAPEX) and operational expenditures (OPEX). This is no easy feat, requiring IT organizations to focus on achieving even greater efficiency in IT operations and management, to reduce ongoing costs and TCO for the infrastructure.

PROVIDE SECURE DATA SHARING AND COLLABORATION TO HELP IMPROVE PATIENT OUTCOMES

One of the key concepts for improving patient outcomes is the collaborative care model, where care is coordinated and managed across different health services and providers. To collaborate effectively with other healthcare professionals, organizations must be able to share patient data across the care spectrum—which requires not only interoperability but Health Insurance Portability and Accountability Act (HIPAA)-compliant security processes and systems. In addition to sharing healthcare data outside of the organization, the IT organization needs to be able to manage, secure, and store enormous amounts of healthcare data internally while adhering to HIPAA guidelines for protection of personal healthcare information.

PROVIDE MOBILE, CONSUMER-FACING APPLICATIONS TO SUPPORT POPULATION HEALTH

Market research and analysis firm IDC predicts that by 2018, 7 out of 10 healthcare organizations will invest in consumer-facing apps, technologies, wearables, and virtual care to help reduce costs associated with managing chronic conditions.¹ The IT organization needs an infrastructure and application environment that supports agile development of mobile applications and the integration and interoperability of the Internet of (Medical) Things, including a range of medical devices.

To deliver everything the healthcare organization needs to transform its business, the IT organization must start with a strategy to deploy an optimal IT infrastructure—one that provides the reliability and stability that are imperative for healthcare, while laying the groundwork for innovation and agility.

¹ “IDC Reveals Health Insights Predictions for 2015,” IDC, Nov. 20, 2014.

I.T. INFRASTRUCTURE FOR TODAY'S HEALTHCARE ORGANIZATION

There's no doubt that the rate and extent of change in the healthcare industry has created tremendous pressure for the IT organization, but it's also created opportunities. Timing has never been better for making a compelling business case for abandoning the status quo and embracing what leading companies in other industries recognize as the catalyst for IT innovation: a modern, standardized IT infrastructure based on open source technologies. A modern IT infrastructure delivers not only reliability, stability, and security but offers the agility for an organization to efficiently adopt cloud, big data, and other new technologies.

STANDARDIZE AND MODERNIZE FOR EFFICIENCY AND SAVINGS

When you standardize and modernize your core business infrastructure, you increase efficiency and cost savings by eliminating layers of complexity that drive up labor costs, downtime, training, and operational overhead. When you standardize to reduce the number of variations in core technologies, you streamline IT maintenance, support, and management, resulting in lower operating expenses.

TURN TO OPEN SOURCE FOR RELIABLE, STABLE, AND SECURE INNOVATION

At the same time you're lowering operating expenses through standardization and modernization, you significantly reduce IT capital expenses with open source technologies. And unlike proprietary solutions, open source software is created by hundreds of thousands of developers—including those from the healthcare industry—who are using and improving the software to meet their needs. In this way, open source builds on and contributes to community innovation. Because the source code is open, it is a more flexible, interoperable, reliable, and secure alternative to proprietary systems.

Here's some evidence:

- IT research and advisory firm Gartner predicts that by 2016 the vast majority of mainstream IT organizations will include important elements of open source software in critical IT solutions.²
- Open source software has been shown to have fewer defects and therefore fewer security vulnerabilities that cyberattackers can exploit, compared to proprietary code.³

DEPLOY OPEN HYBRID CLOUD FOR INCREASED AGILITY AND PRODUCTIVITY

IDC predicts that the majority of healthcare data—80%—will pass through the cloud by 2020, as providers increasingly use the cloud for data collection, aggregation, analytics, and decision-making.⁴

Beyond the value of data management, taking advantage of the faster access, greater efficiency, and increased productivity inherent in cloud-based capabilities such as Infrastructure-as-a-Service (IaaS) and Platform-as-a-Service (PaaS) lets healthcare organizations deliver new technologies and applications at the speed the business requires.

² "Widespread Use of Open Source Software Demands Strong and Effective Governance," Gartner, Aug. 13, 2014.

³ "2013 Coverity Scan Report," Coverity, 2014.

⁴ "IDC Reveals Health Insights Predictions for 2015," IDC, Nov. 20, 2014.

An open hybrid cloud infrastructure lets healthcare organizations

- Take advantage of existing IT investments and infrastructure.
- Build a cloud infrastructure that spans physical servers, virtualization platforms, and different public clouds.
- Ensure portability of applications and data across clouds.
- Evolve to the cloud, gaining incremental value at each step.

A recent survey shows that Linux® is the first choice for the cloud, with 75% of enterprises reporting that they use Linux as their primary cloud platform.⁵

HEALTHCARE SUCCESS WITH RED HAT

By choosing Red Hat® solutions, healthcare organizations can improve operational efficiency, reduce cost and complexity, and speed application delivery while improving interoperability, security, and flexibility. That's why 100% of Fortune 500 healthcare companies use Red Hat products and solutions.⁶

The following leading healthcare organizations have transformed their businesses with Red Hat technology and services.

CIGNA FUELS INNOVATION WITH SELF-SERVICE INFRASTRUCTURE PROVISIONING

To meet the growing demands of the business and respond more quickly to changing requirements, Cigna application development teams adopted agile development methodologies. While this helped the teams develop and modify their applications more quickly and efficiently, the infrastructure organization was not prepared to respond in kind.

To address this gap, Cigna decided to evolve its internal capabilities to an IaaS model. The goal was to deliver IT self-service via truly automated IT infrastructure provisioning.

Solution

Red Hat products, including Red Hat Enterprise Linux, Red Hat JBoss® Web Server, Red Hat JBoss Enterprise Application Platform, Red Hat Enterprise Virtualization, and Red Hat Satellite Server, were key components in the Cigna Private Cloud (CPC) implementation.

Additionally, Red Hat-supported projects such as Foreman, OpenStack®, and FreeIPA were critical to the initiative's success. CPC will use other Red Hat technologies such as Red Hat JBoss BRMS and, eventually, Red Hat JBoss Data Grid as cloud services become a reality. Finally, CPC is being built with an eye on "pluggability" so it can introduce PaaS technologies such as OpenShift by Red Hat in the near future.

Results

The Cigna infrastructure group can now deliver services to internal customers much more quickly. The ability to quickly stand up infrastructure has caught up with the rapid application development and agile methodologies that Cigna development organizations are using. CPC has also helped eliminate barriers and foster harmony between development and infrastructure groups. Today, interactions between these two groups are nearly seamless.

>> [Read more about Cigna's private cloud initiative](#)

⁵ "2014 Enterprise End User Report," Linux Foundation, 2014.

⁶ Red Hat client data and Fortune Global 500 list, 2014.

KING'S COLLEGE EXCHANGES CRITICAL PATIENT INFORMATION QUICKLY AND RELIABLY

King's College Hospital (KCH) NHS Foundation Trust needed a new middleware platform that would allow more than 50 hospital systems to exchange critical patient information quickly and reliably. The team had less than one year to implement a new integration hub capable of handling large volumes of messages between enterprise systems, transferring and transforming them at high speeds and ensuring that the integrity of messages was preserved in transit.

Solution

Red Hat partner Answer Consulting implemented an integration hub based on Red Hat JBoss Fuse. KCH needed a robust, enterprise-class open source solution that came with a full range of professional 24x7 support and services. This was essential in giving the team at KCH the confidence to deploy technology that would be used to integrate critical hospital systems. A busy hospital cannot stop admitting and treating patients because an IT system link has failed or the IT staff member who knows how to fix it is off-duty or moves to another job.

Results

By implementing Red Hat JBoss Fuse, KCH now has a faster, more reliable integration hub capable of seamlessly integrating different hospital enterprise systems. Despite the complexity of the project and the limited time available to complete it, KCH introduced Red Hat JBoss Fuse with no impact on the users of systems throughout the hospital's wards, departments, and offices and required no changes in their work practices. Today, the solution is used by the majority of hospital systems at KCH that need to exchange data with other systems.

>> [Read more about King's College data integration hub](#)

CERNER BOOSTS PERFORMANCE AND STABILITY OF APPLICATIONS

Healthcare IT solutions and services giant Cerner Corporation is continually evaluating the technology used to deliver its application hosting services, with the goal of achieving new levels of stability and performance for its clients and users. To that end, it looked to standardize the application hosting environment for its Cerner Millennium application suite, focusing on stability, performance, and cost. The Cerner Millennium architecture is the healthcare industry's first patient-centric integrated architecture. It gives caregivers and supporting personnel the ability to view lab results, medical problems, diagnoses, medications, and other pertinent information about a patient in real time.

Solution

Cerner's primary database vendor, Oracle, specifically recommended Red Hat Enterprise Linux as the best Linux distribution for running its products. Cerner migrated the database tier of Cerner Millennium to Red Hat Enterprise Linux running on HP ProLiant servers. After the success of the database layer migration, Cerner ported the entire Cerner Millennium suite of applications over to Red Hat Enterprise Linux.

Results

After migrating to Red Hat Enterprise Linux on Intel-based HP servers, Cerner immediately saw improvements in the uptime, stability, and performance of the Millennium suite. In addition, by migrating to a lower-cost platform, Cerner achieved long-term savings as well as performance enhancements. For its clients, the transition was seamless.

>> [Read more about Cerner's infrastructure modernization](#)

CONCLUSION

Few industries today offer a more challenging environment for IT leaders than healthcare. From stringent regulations to business system upheavals, obstacles are seemingly at every turn. Yet savvy healthcare executives are turning these challenges into opportunities to make their IT organizations into centers of innovation excellence.

It takes the right foundation to make core IT operations more efficient and cost-effective while at the same time enabling the rapid development and deployment of innovative new capabilities. Open technology from Red Hat provides a foundation for solving today's healthcare IT challenges while preparing healthcare organizations for the future.



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ABOUT RED HAT

Red Hat is the world's leading provider of open source solutions, using a community-powered approach to provide reliable and high-performing cloud, virtualization, storage, Linux, and middleware technologies. Red Hat also offers award-winning support, training, and consulting services. Red Hat is an S&P company with more than 80 offices spanning the globe, empowering its customers' businesses.

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